

209

FINAL FIELD SAMPLING AND ANALYSIS REPORT

**CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809**

EPA Region 5 Records Ctr.



360984

Submitted to:

**Mr. Brian Freeman
U.S. Environmental Protection Agency
Region 5 DE-9J
77 West Jackson Boulevard
Chicago, Illinois 60604**

Submitted by:

**TechLaw, Inc.
20 North Wacker Drive, Suite 1260
Chicago, Illinois 60606**

**EPA Work Assignment No.
Contract No.
TechLaw WAM
Telephone No.
EPA WAM
Telephone No.**

**R05020
68-W4-0006
Patricia Brown-Derocher
312/345-8963
Brian Freeman
312/353-2720**

September 10, 1998

**Chemetco Insolvency
008381**

FINAL FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
2.0 FACILITY DESCRIPTION	2
3.0 SAMPLING AND ANALYSIS PROCEDURES	3
3.1 Waste Streams	3
3.1.1 Waste Slag	3
3.1.2 Zinc Oxide	4
3.1.3 Baghouse Dust	4
3.1.4 Spent Refractory Brick	5
3.2 Soil	5
3.3 Surface Water and Sediment	6
3.4 Quality Control	6
3.5 Sample Custody and Shipment	7
3.6 Data Validation	7
3.7 Decontamination and Waste Management	7
4.0 ANALYTICAL RESULTS	8
4.1 Waste Streams	8
4.1.1 Waste Slag	8
4.1.2 Zinc Oxide	10
4.1.3 Baghouse Dust	12
4.1.4 Spent Refractory Brick	13
4.2 Soil	14
4.2.1 Parking Lot Soil	14
4.2.2 Former Spent Brick Pile Soil	15
4.2.3 East Runoff Area Soil	17
4.2.4 Background Soil	18

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

<u>Section</u>	<u>Page</u>
4.3 Surface Water and Sediment	19
4.3.1 Long Lake	19
4.3.2 South Wetland Area	22
4.3.3 East Runoff Area	23
4.3.4 Non-Contact Cooling Water Pond	24
5.0 DATA VALIDATION	25
5.1 Total Metals Data Validation	25
5.2 TCLP Metals Data Validation	27

Tables

Table 4.1.1 Waste Slag TCLP Metal Concentrations	9
Table 4.1.2a Zinc Oxide Total Metal Concentrations	11
Table 4.1.2b Zinc Oxide TCLP Metal Concentrations	11
Table 4.1.3 Baghouse Dust TCLP Metal Concentrations	12
Table 4.1.4 Spent Refractory Brick TCLP Metal Concentrations	13
Table 4.2.1a Parking Lot Soil Total Metal Concentrations	15
Table 4.2.1b Parking Lot Soil TCLP Metal Concentrations	15
Table 4.2.2a Former Spent Brick Pile Soil Total Metal Concentrations	16
Table 4.2.2b Former Spent Brick Pile Soil TCLP Metal Concentrations	17
Table 4.2.3a East Runoff Area Soil Total Metal Concentrations	18
Table 4.2.3b East Runoff Area Soil TCLP Metal Concentrations	18

FINAL FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

Tables

Page

Table 4.2.4	Background Soil Total Metal Concentrations	19
Table 4.3.1	Long Lake Surface Water and Sediment Total Metal Concentrations	21
Table 4.3.2	South Wetland Area Surface Water and Sediment Total Metal Concentrations .	22
Table 4.3.3	East Runoff Area Surface Water and Sediment Total Metal Concentrations . . .	23
Table 4.3.4	Non-Contact Cooling Water Pond Surface Water and Sediment Total Metal Concentrations	24

Appendices

Appendix A	Facility Layout and Sample Locations
Appendix B	Photograph Log
Appendix C	Field Logs
Appendix D	Chain-of-Custody Forms
Appendix E	Investigation-Derived Waste Manifests
Appendix F	USGS Topographic Map

FIELD SAMPLING AND ANALYSIS REPORT

**CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809**

1.0 INTRODUCTION

The United States Environmental Protection Agency (U.S. EPA) Region 5 requested TechLaw, Inc. (TechLaw) to support the Agency in conducting sample collection at the Chemetco, Inc. (Chemetco) facility in Hartford, Illinois. This document constitutes the Field Sampling and Analysis Report for waste, soil, surface water, and sediment sampling performed by TechLaw at the Chemetco facility.

The sampling event occurred on May 28 and 29, 1998 and was undertaken in accordance with the Site-Specific Sampling and Analysis Plan (SAP) submitted to U.S. EPA on May 8, 1998. The SAP was used in conjunction with TechLaw's U.S. EPA-approved Region 5 Generic Quality Assurance Project Plan (QAPP) for Sampling Operations, dated January 1995. TechLaw utilized QST Environmental Laboratory (Gainesville, Florida), a TechLaw Team Subcontractor, to perform the analyses required under the SAP.

The sampling event was undertaken by TechLaw Field Team members Mr. Kevin Higgins, Mr. John Koehnen, Mr. Doug Updike, and Mr. Anthony Mubiru. Also present during the sampling event were Mr. Patrick Kuefler, U.S. EPA Region 5 and Mr. Chris Chanovsky, Illinois EPA (IEPA). Chemetco was represented during the sampling event by Cindy Davis and Heather Young of CSD Environmental Services (CSD), environmental consultant to the facility.

Maps showing the facility layout and sample locations are provided in Appendix A. A Photograph Log of the sampling event is provided in Appendix B, and Field Logs of all sampling activities are provided in Appendix C. Copies of the chain-of-custody forms are provided in Appendix D, investigation-derived waste manifests relating to the sampling event are provided in Appendix E, and a USGS topographic map showing the facility location is provided in Appendix F.

2.0 FACILITY DESCRIPTION

The Chemetco facility is located at the intersection of Illinois Route 3 and Oldenberg Road, in an industrial and agricultural area in Madison County, Illinois (Appendices A and F). Chemetco operations are conducted on an approximately 40-acre parcel of land surrounded by a chain link fence. Chemetco owns an additional 230 acres of land in the vicinity of the facility. The Chemetco facility is located in the floodplain of the Mississippi River in an area locally referred to as the American Bottoms.

The Chemetco facility was constructed in 1969 and initiated operations as a copper smelter in 1970 to derive copper and other non-ferrous metals and alloys from recyclable copper-bearing scrap and manufacturing residues. The Chemetco facility produces anode copper, cathode copper, and crude lead-tin solder. The facility generates four primary solid waste streams, which are waste slag, zinc oxide, baghouse dust, and spent refractory brick.

Waste slag at the Chemetco facility is generated from both water-cooled and air-cooled processes. File material indicates that slag is stored on-site in areas identified as "Units" (Appendix A). However, during the sampling effort, no distinct boundaries were observed separating the Units, and it appeared the facility managed a single continuous slag pile (Appendix A). Information obtained from the IEPA indicated that the slag had historically been shown to be high in total lead but EP Tox analysis in the 1980s found the slag to not exhibit a characteristic of a hazardous waste under EP Tox. Prior to the sampling effort reported here, it does not appear that the slag piles were analyzed directly to determine if the slag is characteristically hazardous for lead using the Toxicity Characteristic Leaching Procedure (TCLP) since TCLP became the required method of determining if a waste exhibited the characteristic of toxicity.

*Ever stored
in "Units" ???*

The facility operates a total of four baghouses to control air emissions from the various operations of the smelter and slag granulation processes (Appendix A). The facility has indicated to U.S. EPA that the baghouse dust is TCLP hazardous for lead and cadmium. Currently, the baghouse dust from all baghouses is reportedly transported off-site as hazardous waste. The four baghouses are designated as:

- No. 1 Baghouse;
- No. 2 Baghouse, also known as the "Roof Baghouse";
- Slag Granulation Plant, Primary Baghouse; and,
- Slag Granulation Plant, Secondary Baghouse.

*Baghouse Bags are disposed of
dust is reused in DTS*

Process wastewater generated from a venturi scrubber system is currently discharged to an open concrete tank for settling solids which are subsequently de-watered in a zinc oxide filter press. The filter cake from the press is described as zinc oxide. In the past, process wastewater was routed to lagoons for settling and subsequent de-watering of the residual solids. The resulting material was stored on-site in a zinc oxide pile which was later converted to a Zinc Oxide

Bunker. Currently, zinc oxide is staged in this location prior to off-site disposal. The facility has indicated to U.S. EPA that the zinc oxide material currently stored in the Zinc Oxide Bunker and the current zinc oxide generated at the facility are TCLP hazardous for lead and cadmium.

only if disposed of

Spent refractory brick from smelting operations is currently generated and stored on-site. Up to five types of spent brick, of various compositions, are currently generated at an unspecified rate. Information obtained from the IEPA indicates that the spent refractory brick is TCLP hazardous for lead and cadmium.

if disposed of

3.0 SAMPLING AND ANALYSIS PROCEDURES

3.1 Waste Streams

The four primary waste streams of concern were characterized during the sampling effort: waste slag, zinc oxide, baghouse dust, and spent refractory brick. All sample numbers and sampling locations (Figure 2 in Appendix A) were determined under the direction of Mr. Kuefler.

*brick + dust used not waste streams
slag not characterized w/ this # of samples (20)*

Chemetco representatives collected split samples of all waste slag samples and spent refractory brick samples collected by TechLaw. Chemetco did not collect split samples of the zinc oxide or baghouse dust samples collected by TechLaw.

3.1.1 Waste Slag

A total of 20 waste slag samples were collected from the waste slag storage areas (e.g., "Units") and analyzed for RCRA TCLP metals. The total number of samples and the location of the sampling stations were determined in the field at the direction of Mr. Kuefler. In general, sampling locations were spread across the waste slag storage areas (Photos 1 through 19) and comprised waste slag pieces of various sizes from different elevations of the slag pile. In addition to the primary waste slag storage area (i.e., Unit 5) in the northwest corner of the Chemetco facility, waste slag was present across the facility in piles and in roadways (Photo 32).

Five waste slag samples were collected at the "Grizzly" slag hopper conveyors (Photos 1, 2, 3): SL-001, SL-002, SL-003, SL-004, SL-005. Each conveyor sorted the slag into distinct piles based on particle size. Four waste slag samples were collected from a large, excavated area in the vicinity of the waste slag pile (Photo 19): SL-011, SL-012, SL-013, and SL-014. Three waste slag samples were collected in the northeast portion of the waste slag pile: SL-018, SL-019, and SL-020. Eight waste slag samples were randomly collected along the slag roadway leading into the waste slag pile approximately every 75 feet: SL-006, SL-007, SL-008, SL-009, SL-010, SL-015, SL-016, and SL-017.

All waste slag samples were collected using a stainless-steel spoon or stainless-steel hand auger and were homogenized in a stainless-steel bowl. Samples were collected as composites of

sampling locations except for samples SL-006 (Photo 5), SL-013 (Photo 13), and SL-014 (Photo 13) which were collected as discrete, samples of fine waste slag material. The composite samples were collected by sampling from at least three sub-areas within a sampling location. These locations were randomly chosen and were generally in the center of the sampling location. The composited materials were then homogenized to further aid in collection of representative samples.

At some locations, plastic bags were required for the collection of waste slag samples due to the inability to reduce the size of waste slag pieces to facilitate sample collection in 8-ounce, glass jars. The use of the plastic bags is a deviation from the SAP, but is not expected to have an impact on analytical results since inorganics are the constituents of concern.

3.1.2 Zinc Oxide

Four zinc oxide samples were collected from two areas of the facility and analyzed for RCRA total metals and RCRA TCLP metals. Three zinc oxide samples were collected from the Zinc Oxide Bunker (Photos 21 through 25): ZO-001, ZO-002, and ZO-003. One zinc oxide sample (ZO-004) was collected from a front-end loader at the filter press (Photos 26, 27) which had been ~~filled~~ ^{taken} directly from the ~~wastes generated~~ ^{material} at the filter press on May 29, 1998. ^{DIS}

The Zinc Oxide Bunker samples were collected in close proximity to the north portion of the bunker as the wet, un-compacted material represented a potential hazard in relation to collapsing. In addition, an air-purifying respirator (APR) was worn during sample collection.

All zinc oxide samples were collected as near-surface samples from a depth between zero and 6 inches below ground surface. All samples were collected with a stainless-steel spoon and were homogenized in a stainless-steel bowl.

3.1.3 Baghouse Dust

One baghouse dust sample was collected from each of the four baghouses: No. 1 Baghouse (Photo 28); the No. 2 Baghouse, also known as the "Roof Baghouse" (Photos 29, 30, 31); the Primary Baghouse of the Slag Granulation Plant (Photos 33, 34); and, the Secondary Baghouse of the Slag Granulation Plant (Photo 35). The samples were numbered consecutively from BD-001 through BD-004.

^{Baghouse Dust}
All zinc oxide samples were collected as discrete, samples from a depth between zero and 6 inches below the surface of the dust. All samples were collected with a stainless-steel spoon and were homogenized in a stainless-steel bowl. In addition, an APR was worn during sample collection.

3.1.4 Spent Refractory Brick

A total of six spent refractory brick samples were collected from several co-mingled spent refractory brick piles on the southeast side of the Zinc Oxide Bunker (Photos 36, 37, 38, 39, 40) and analyzed for RCRA TCLP metals.. Five brick types were selected in the field at the direction of Mr. Kuefler. The bricks were broken with a hammer and cold chisel to facilitate collection of representative samples and samples split by facility representatives.

A sixth sample was collected as a composite of smaller brick pieces in the pile. This composite sample was collected using a stainless-steel spoon and homogenized in a stainless-steel bowl.

Plastic bags were required for the collection of the spent refractory brick samples due to the inability to reduce the size of brick pieces to facilitate sample collection in 8-ounce, glass jars. The use of the plastic bags is a deviation from the SAP but is not expected to have an impact on analytical results since inorganics are the constituents of concern.

3.2 Soil

A total of 13 soil samples were collected in three general areas surrounding the facility: parking lot (toe area), former spent brick pile, and east runoff area. All soil samples were analyzed for RCRA total metals. Based upon a review of the RCRA total metals results, nine of the thirteen samples were also analyzed for cadmium and lead using the TCLP. Chemetco representatives collected split samples of all soil samples taken by TechLaw.

Four soil samples were collected from the parking lot (Photos 41, 42, 43, 44): SS-001, SS-002, SS-003, and SS-004. Four soil samples were collected from the former location of the spent brick pile to the south of the facility (Photos 45, 46, 47, 48): SS-005, SS-006, SS-007, and SS-008. Five soil samples were collected from the east runoff area located to the east and northeast of the waste slag pile (Photos 49, 50, 51, 52): SS-009, SS-010, SS-011, and SS-012. All sample locations were determined in the field at the direction of Mr. Kuefler.

In addition, three background soil samples were collected and analyzed for RCRA total metals to determine natural, background concentrations of inorganics in the vicinity of the Chemetco facility. One background soil sample was collected in the south wetland area (Photo 63), and two background soil samples were collected in a grassy open field in the area of a residence south of the facility across Long Lake (Photos 64, 65).

All soil samples were collected as near-surface samples from a depth between zero and 6 inches below ground surface. All samples were collected using a stainless-steel spoon or stainless-steel hand auger and were homogenized in a stainless-steel bowl.

3.3 Surface Water and Sediment

A total of eight surface water and eight co-located sediment samples were collected from four different general areas of the facility property and were analyzed for RCRA total metals. Chemetco representatives collected split samples of all surface water and sediment samples obtained by TechLaw.

Three water/sediment samples were collected in the surface water body to the south of the facility identified as Long Lake (Photos 53, 54, 55): SW-001/SD-001, SW-002/SD-002, and SW-003/SD-003. Three water/sediment samples were collected in the south wetland area located to the south of the parking lot (Photos 56, 57, 58): SW-004/SD-004, SW-005/SD-005, and SW-006/SD-006. One water/sediment sample (SW-008/SD-008) was collected in the east runoff area (Photo 62) where it was observed that runoff from the waste slag pile was occurring and had accumulated in this area. One water/sediment sample was collected from a pond identified as a ~~non-contact cooling water pond and stormwater pond~~ within the fenced facility (Photos 59, 60, 61): SW-007/SD-007.

They also visible on ground surface where sample was taken

not

if this is correct than isn't it exempt from RCRA?

The surface water samples were collected either by directly dipping the sample container into the sampling location or by collecting water in a certified-clean, 8-ounce jar and transferring the water sample to the sample container. Field analytical parameters, including temperature, conductivity, turbidity, pH and dissolved oxygen (DO) were collected using a Horiba Water Quality Monitor. However, due to equipment malfunction, DO measurements are available only for surface water sampling locations SW-001 and SW-002.

All sediment samples were collected as discrete samples from a depth between zero and 6 inches below ground surface. All samples were collected using a stainless-steel spoon or stainless-steel hand auger and were homogenized in a stainless-steel bowl.

3.4 Quality Control Samples

TechLaw personnel collected three types of Quality Assurance/Quality Control (QA/QC) samples: field duplicates, matrix spike/matrix spike duplicates (MS/MSD), and equipment rinsate blanks. One field duplicate was collected for every 10 environmental media samples collected per matrix. An MS/MSD sample was collected for every 20 environmental media samples collected per matrix.

One equipment rinsate blank was collected for every 10 samples collected which utilized the sampling equipment. The equipment blank was collected with certified de-ionized water provided by the contracted laboratory. The equipment blanks were collected from the decontaminated auger heads, a stainless steel spoon, and a stainless steel bowl (Photo 66).

During the course of the sampling event, seven field duplicates, nine MS/MSDs, and five equipment blanks were collected. All QA/QC samples were handled in the same manner described above for the environmental media sampling.

3.5 Sample Custody and Shipment

All sample containers and sample bags were appropriately labeled and tagged in accordance with TechLaw's U.S. EPA-approved Region 5 Generic QAPP. A chain-of-custody (COC) form (Appendix D) accompanied the samples from the point of origin to the analytical laboratory. All samples collected by TechLaw remained in the custody of the TechLaw Sampling Team until shipment to QST Environmental (Gainesville, Florida). All samples were shipped overnight via Federal Express on June 1, 1998. All samples were received by QST Environmental on June 2, 1998 with custody seals intact, as identified in the QST Cooler Receipt Form (Appendix D).

3.6 Data Validation

Analytical data generated by QST Environmental was provided to TechLaw in conformance with Contract Laboratory Program (CLP)-like reporting protocols. All analytical data were validated by a member of the TechLaw Team, independent of the sampling team, utilizing the *Functional Guidelines for Inorganic Data Validation*. Specific data package and data validation procedures are outlined in TechLaw's U.S. EPA-approved Region 5 Generic QAPP.

3.7 Decontamination and Waste Management

All sampling equipment used in the sampling effort was decontaminated before the sampling event and between sample locations using an Alconox[®] soap wash, a tap water rinse, and a deionized water rinse. Sampling equipment utilized in this effort included stainless-steel spoons, auger heads, and stainless steel bowls.

All investigation-derived waste (IDW), including the decontamination water and all personal protective equipment (PPE), was accumulated in two, 55-gallon, steel drums which were staged on a pad in a secured area on southeast portion of the Chemetco facility property. The staging of the drums was undertaken per the direction of facility representatives from CSD.

A U.S. EPA Identification Number (ILP200000130) and State Of Illinois Identification Number (1198015008) were acquired to allow for the management of the two drums of IDW. Manifests were completed for the two drums of IDW and were signed by Mr. Kuefler, U. S. EPA (Appendix E). The drums were labeled hazardous for RCRA TCLP metals, minus mercury. The drums of IDW were transported by Heritage Transport (IND058484114) on May 29, 1998 to Heritage Environmental Services (IND093219012), a permitted treatment, storage, and disposal (TSD) facility. The two drums of IDW were received by Heritage Environmental Services on June 6, 1998.

4.0 ANALYTICAL RESULTS

4.1 Waste Streams

Analytical results of the waste stream sampling effort are presented in Table 4.1.1. through Table 4.1.4. Undetected constituents are flagged "U" with a corresponding detection limit. Estimated values are flagged "J".

4.1.1 Waste Slag

Analytical results of the waste slag RCRA TCLP metals analysis are presented in Table 4.1.1. All 20 waste slag samples contained TCLP lead concentrations above the regulatory limit of 5 mg/L. Two waste slag samples (SL-014, SL-018) contained TCLP cadmium concentrations above the regulatory limit of 1 mg/L, and waste slag sample (SL-002) is near the cadmium TCLP regulatory limit. No waste slag samples were above the TCLP regulatory limits for arsenic, barium, chromium, mercury, selenium, or silver.

With regards to the waste slag TCLP lead results, statistical calculations were performed on the reported concentrations with the following results (mg/L):

Mean	35.2
Standard Error	4.52
Median	32.75
Standard Deviation	20.23
Sample Variance	409.45
Range	68.1
Minimum Value	11.8
Maximum Value	79.9
Confidence Level (95%)	9.47

The confidence level of the mean (9.47 mg/L) indicates that 95 percent of all TCLP lead results are between 25.7 and 44.7 mg/L (35.2 mg/L +/- 9.47 mg/L). The lower confidence limit of the mean statistically provides an estimate of the minimum value of 95 percent of the slag material which was characterized. The confidence level indicates that 95 percent of the slag pile area which was characterized has a TCLP lead concentration of at least 25.7 mg/L, which is over five times the regulatory limit (5 mg/L). Thus, while 100 percent of the samples are at least two times the regulatory limit (minimum value 11.7 mg/L), over 95 percent of the samples were statistically characterized as over five times the regulatory limit.

Table 4.1.1
Waste Slag TCLP Metal Concentrations
(mg/L)

RCRA Metal	SL-001	SL-002	SL-003	SL-004	SL-005	SL-006	SL-007	SL-008	SL-009	SL-010
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.7	1.6	1.0	0.9	0.4	1.7	1.6	1.2	1.4	1.8
Cadmium	0.16	0.93	0.50	0.58	0.01	0.51	0.66	0.16	0.39	0.32
Chromium	0.040	0.027	0.050	0.033	0.015	0.076	0.042	0.028	0.044	0.030
Lead	18.4	16.6	11.8	15.4	20.5	39.2	56.6	14.6	79.9	27.7
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

RCRA Metal	SL-011	SL-012	SL-013	SL-014	SL-015	SL-016	SL-017	SL-018	SL-019	SL-020
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.8	2.7	0.6	0.6	1.7	1.8	0.8	0.8	0.8	0.7
Cadmium	0.21	0.18	0.64	1.11	0.44	0.25	0.01	1.32	0.09	0.23
Chromium	0.031	0.017	0.037	0.058	0.033	0.130	0.020	0.022	0.042	0.030
Lead	54.4	17.2	43.9	50.6	56.0	21.0	38.2	67.7	37.8	17.0
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.200 U	0.100 U	0.100 U	0.200 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

4.1.2 Zinc Oxide

Analytical results for zinc oxide samples RCRA total metal concentrations are presented in Table 4.1.2a, and analytical results of zinc oxide samples RCRA TCLP metal concentrations are presented in Table 4.1.2b. All zinc oxide TCLP samples are above the regulatory limit for lead (5 mg/L) and cadmium (1 mg/L).

The lead sampling results indicate differences between the zinc oxide filter press sample (ZO-004) and the Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003). The total lead concentration of the zinc oxide filter press sample (ZO-004) is 25,400 mg/L, which is 16 percent less than the mean of the total lead concentrations of the three Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003) which was calculated to be 30,066.7 mg/L. However, the TCLP lead concentration of the zinc oxide filter press sample (ZO-004) is 213 mg/L which is 700 percent higher than the mean of the of the three Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003) which was calculated to be 30.3 mg/L.

The cadmium sampling results indicate a difference between the zinc oxide filter press sample (ZO-004) and the Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003).

The total cadmium concentration of the zinc oxide filter press sample (ZO-004) is 3,010 mg/L, which is 31 percent higher than the mean of the total cadmium concentrations of the three Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003) which was calculated to be 2291 mg/L. The TCLP cadmium concentration of the zinc oxide filter press sample (ZO-004) is 23.7 mg/L which is 60 percent higher than the mean of the of the three Zinc Oxide Bunker samples (ZO-001, ZO-002, ZO-003) which was calculated to be 14.8 mg/L.

No zinc oxide samples were above the TCLP regulatory limits for arsenic, barium, chromium, mercury, selenium, or silver. No significant differences between the zinc oxide filter press sample and the Zinc Oxide Bunker samples were noted with regard to arsenic, barium, chromium, mercury, selenium, or silver.

Table 4.1.2a
Zinc Oxide
Total Metal Concentrations
(mg/kg)

RCRA Metal	ZO-001	ZO-002	ZO-003	ZO-004
Arsenic	359	193 U	110 U	130 U
Barium	1190	1580	3100	1280
Cadmium	2890	3280	704	3010
Chromium	100	56.6	50.4	76.9
Lead	40000	32000	18200	25400
Mercury	15.9 J	30.3 J	3.61 J	20.7 J
Selenium	198 U	193 U	110 U	130 U
Silver	43.70	55.50	25.80	105

Table 4.1.2b
Zinc Oxide
TCLP Metal Concentrations
(mg/L)

RCRA Metal	ZO-001	ZO-002	ZO-003	ZO-004
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.5	0.3	0.6	0.6
Cadmium	22.50	13.40	8.38	23.70
Chromium	0.010 U	0.010 U	0.010 U	0.010 U
Lead	8.5	23.8	58.8	213.0
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0005 J
Selenium	1.000 U	2.000 U	0.500 U	1.000 U
Silver	0.050 U	0.100 U	0.005 U	0.050 U

4.1.3 Baghouse Dust

Analytical results of baghouse dust samples for RCRA TCLP metals are presented in Table 4.1.3. All baghouse dust samples were above the TCLP regulatory limit for lead (5 mg/L) and cadmium (1 mg/L).

The TCLP lead concentrations range from 835 mg/L for the No. 1 Baghouse (BD-001) to 27.4 mg/L for the No. 2 Baghouse/Roof Baghouse (BD-002). The Primary Baghouse of the Slag Granulation Plant (BD-003) and the Secondary Baghouse of the Slag Granulation Plant (BD-004) have TCLP lead concentrations of 89.5 mg/L and 48.3 mg/L, respectively.

The TCLP cadmium concentrations range from 56.0 mg/L for the Secondary Baghouse of the Slag Granulation Plant (BD-004) to 7.97 mg/L for the Primary Baghouse of the Slag Granulation Plant (BD-003). The No. 1 Baghouse (BD-001) and the No. 2 Baghouse/Roof Baghouse (BD-002) have TCLP cadmium concentrations of 36.9 mg/L and 54 mg/L, respectively.

No baghouse dust samples were above the TCLP regulatory limits for arsenic, barium, chromium, mercury, selenium, or silver. No significant differences between the baghouse dust samples were noted with regard to arsenic, barium, chromium, mercury, selenium, or silver.

Table 4.1.3
Baghouse Dust
TCLP Metal Concentrations
(mg/L)

RCRA Metal	BD-001	BD-002	BD-003	BD-004
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.2	0.1	0.3	0.1
Cadmium	36.90	54.00	7.97	56.00
Chromium	0.010 U	0.037	0.010 U	0.010 U
Lead	835	27.4	89.5	48.3
Mercury	0.0006 J	0.11 J	0.0016 J	0.0002 J
Selenium	2.000 U	10.00	0.800 U	0.600 U
Silver	0.100 U	0.500 U	0.005 U	0.005 U

4.1.4 Spent Refractory Brick

Analytical results of spent refractory brick samples for RCRA TCLP metals are presented in Table 4.1.4. Two brick samples (RB-001 and RB-006) are above the TCLP regulatory limit for both lead (5 mg/L) and cadmium (1/mg/L). All other brick samples are below the TCLP regulatory limits for all RCRA metals.

Brick sample RB-006, with high TCLP lead (6.7 mg/L) and cadmium (1.35 mg/L), represents a composite sample of three areas of brick pieces and associated brick pile material. The material composited for RB-006 represented a visibly significant portion of the spent refractory brick pile (Photos 36, 37).

Table 4.1.4
Spent Refractory Brick
TCLP Metal Concentrations
(mg/L)

RCRA Metal	RB-001	RB-002	RB-003	RB-004	RB-005	RB-006
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	1.0	0.2	0.2	0.5	0.2	1.2
Cadmium	2.21	0.005 U	0.005 U	0.005 U	0.005 U	1.35
Chromium	0.066	0.010 U	2.020	0.010 U	0.852	0.010 U
Lead	33.0	0.1	0.050 U	0.050 U	0.050 U	6.7
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

4.2 Soil

4.2.1 Parking Lot Soil

The parking lot soil results (Table 4.2.1) indicate high levels of lead and cadmium when compared to the background soil (Table 4.2.4) which contains low mean concentrations of lead (74.6 mg/kg) and cadmium (1.49 mg/kg). One sample, SS-004, contains a significant concentration of chromium when compared to background. However, no significant comparisons with background results were noted with regard to arsenic, barium or mercury.

During the sampling event, the parking lot soil samples were observed to contain a mix of slag, soil, gravel, concrete, refractory brick and sand, and the results indicate high lead levels similar to the slag results. The parking lot soil results range from 2,300 mg/kg to 23,200 mg/kg with a mean concentration of 8,518 mg/kg. All samples contain a minimum of 30 times the mean background lead concentration and are a minimum of nearly six times the 400 mg/kg IEPA Tier 1 Industrial soil clean-up objective for lead. One sample, SS-003 (Photo 43), contains a lead level of 23,200 mg/kg, which is 310 times background and 58 times the 400 mg/kg IEPA Industrial clean-up level.

The parking lot soil results indicate a minimum of 18 times the mean background cadmium concentration. However, no samples are above the 1,000 mg/kg IEPA Tier 1 Industrial soil clean-up objective for cadmium.

One sample, SS-003, contains a total chromium concentration of 488 mg/kg, which is nearly 13 times the mean background soil concentration. This sample also contains a total silver concentration of 40.4 mg/kg which is over 60 times the mean detection limit for silver in background.

All four parking lot soil results are above the TCLP regulatory limit for lead (5 mg/L), the IEPA Tiered Approach to Cleanup Objectives (TACO) Migration to Groundwater Route Value for Class I Aquifers (0.0075 mg/L) and the IEPA TACO Migration to Groundwater Route Value for Class II Aquifers (0.1 mg/L). The mean lead concentration for the four samples is 20.1 mg/L, which is over four times the TCLP regulatory limit.

The parking lot soil results for two samples (SS-001 and SS-004) are above the TCLP regulatory limit for cadmium (1 mg/L). All four soil results are above the IEPA TACO Migration to Groundwater Route Value for Class I Aquifers (0.005 mg/L) as well as the Class II Aquifers value (0.05 mg/L). The mean cadmium concentration is 1.2 mg/L which is 20 percent higher than the TCLP regulatory limit.

Although contaminant concentration comparisons to the various TACO remediation values are provided, the appropriate remediation standards for the site, considering all the necessary site-specific factors, have not been determined at the time of this report.

Table 4.2.1a
Parking Lot Soil
Total Metal Concentrations
(mg/kg)

RCRA Metal	SS-001	SS-002	SS-003	SS-004
Arsenic	24.7	68.1 U	200 U	22.1
Barium	310	481	253	173
Cadmium	51.40	27.50	30.80	46.60
Chromium	21.4	37.7	488	38.8
Lead	3880	2300	23200	4690
Mercury	0.459 J	0.199 J	0.46 J	0.399 J
Selenium	16.40	68.1 U	200 U	20.40
Silver	1.90	3.4 U	40.40	0.97

Table 4.2.1b
Parking Lot Soil
TCLP Metals Concentrations
(mg/L)

RCRA Metal	SS-001	SS-002	SS-003	SS-004
Cadmium	1.67	0.74	0.79	1.64
Lead	26.5	11.5	22.7	20.3

4.2.2 Former Brick Pile Soil

The former brick pile soil sample results (Table 4.2.2) indicate high levels of lead and cadmium when compared to the background soil (Table 4.2.4). During the sampling effort, the former brick pile soil samples were described as being a dark-brown, silty-sand with some clay.

The former brick pile soil lead results range from 639 mg/kg to 8,510 mg/kg with a mean concentration of 3,720 mg/kg, which is 50 times greater than the mean background lead concentration. All sample concentrations are above the 400 mg/kg IEPA Tier 1 Industrial soil clean-up objective for lead.

The former brick pile soil cadmium results range from 5.91 mg/kg to 60.10 mg/kg with a mean concentration of 31.2 mg/kg, which is 21 times greater than the mean background cadmium

concentration. However, no samples were above the 1,000 mg/kg IEPA Tier 1 Industrial soil clean-up objective for cadmium.

Two samples, SS-007 and SS-008, contained silver concentrations of 16.3 mg/kg and 14.0 mg/kg, respectively. These concentrations are a minimum of 23 times greater than the mean detection limit for the undetected values for silver in the background samples.

No significant comparisons with background soil results were noted with regard to arsenic, barium, chromium or mercury for any of the former brick pile soil sample results.

Three of the former brick pile soil samples were submitted for TCLP analysis for cadmium and lead. All three samples exhibit lead concentrations above the TCLP regulatory limit (5 mg/L), the IEPA TACO Migration to Groundwater Route Value for Class I Aquifers (0.0075 mg/L) and the IEPA TACO Migration to Groundwater Route Value for Class II Aquifers (0.1 mg/L). The mean lead concentration for the three samples is 18.0 mg/L, which is over three times the TCLP regulatory limit.

None of the former brick pile soil results are above the TCLP regulatory limit for cadmium (1 mg/L). However, all three soil results are above the IEPA TACO Migration to Groundwater Route Value for Class I Aquifers (0.005 mg/L) as well as the TACO Class II Aquifers value (0.05 mg/L). The mean cadmium concentration is 0.70 mg/L.

Although contaminant concentration comparisons to the various TACO remediation values are provided, the appropriate remediation standards for the site, considering all the necessary site-specific factors, have not been determined at the time of this report.

Table 4.2.2a
Former Brick Pile Soil
Total Metal Concentrations
(mg/kg)

RCRA Metal	SS-005	SS-006	SS-007	SS-008
Arsenic	14.9	17.6	46.2	131 U
Barium	194	260	261	482
Cadmium	5.91	13.90	60.10	45.00
Chromium	11.5	19.1	20.8	31.4
Lead	639	2450	3280	8510
Mercury	0.076 J	0.102 J	0.255 J	0.412 J
Selenium	11.5 U	11.20	12.30	131 U
Silver	0.6 U	2.51	16.30	14.00

Table 4.2.2b
Former Brick Pile Soil
TCLP Metals Concentrations
(mg/L)

RCRA Metal	SS-005	SS-006	SS-007	SS-008
Cadmium	N/A	0.30	0.99	0.73
Lead	N/A	14.2	16.1	23.7

N/A = Not analyzed as directed by U.S. EPA Region 5

4.2.3 East Runoff Area Soil

The distribution of the east runoff soil sample results (Table 4.2.3) indicate higher concentrations of lead and cadmium directly east of the facility (SS-009, SS-010, SS-011) when compared to the soil samples collected to the northeast of the facility (SS-012, SS-013). The three samples to the east (SS-009, SS-010, SS-011) also contain high levels of lead and cadmium when compared to the background soil (Table 4.2.4).

The lead results for SS-009, SS-010, and SS-011 range from 359 mg/kg to 2,380 mg/kg with a mean concentration of 1,286 mg/kg, which is 17 times greater than the mean lead background concentration. Two of the samples (SS-009, SS-010) are above the 400 mg/kg IEPA Tier 1 Industrial soil clean-up objective for lead. These samples (SS-009, SS-010) were taken in close proximity to surface water sample location SW-008 and sediment sample location SD-008 which contained visible surface runoff from the slag pile storage area (Photo 62) (see Section 4.3.3 below).

The cadmium results for SS-009, SS-010, and SS-011 range from 4.96 mg/kg to 18.80 mg/kg with a mean concentration of 13.25 mg/kg, which is nine times greater than the mean background level. However, no samples were above the 39 mg/L IEPA Tier 1 Residential soil clean-up objective, or the 1,000 mg/kg Industrial soil clean-up objective.

No significant comparisons with background soil results were noted for SS-012 and SS-013 located to the northeast of the facility. In addition, no significant comparisons with background were noted for arsenic, barium, chromium, mercury, or silver for any of the east runoff area results.

Two of the east runoff area soil samples were submitted for TCLP analysis for cadmium and lead. Neither sample exhibits lead concentrations above the TCLP regulatory limit (5 mg/L). However, both reported concentrations are above the IEPA TACO Migration to Groundwater Route Value for Class I Aquifers (0.0075 mg/L) and the IEPA TACO Migration to Groundwater Route Value for Class II Aquifers (0.1 mg/L). The mean lead concentration for the two samples is 1.3 mg/L.

Neither of the east runoff area soil cadmium results are above the TCLP regulatory limit (1 mg/L).

However, both soil results are above the IEPA TACO Migration to Groundwater Route Value for Class I Aquifers (0.005 mg/L) as well as the TACO Class II Aquifers value (0.05 mg/L). The mean cadmium concentration is 0.15 mg/L.

Although contaminant concentrations comparisons to the various TACO remediation values are provided, the appropriate remediation standards for the site considering all the necessary site-specific factors have not been determined at the time of this report.

Table 4.2.3a
East Runoff Area Soil
Total Metal Concentrations
(mg/kg)

RCRA Metal	SS-009	SS-010	SS-011	SS-012	SS-013
Arsenic	21.1	24.1	13.7	14.1	10.8 U
Barium	265	549	282	250	244
Cadmium	18.80	16.00	4.96	2.95	2.12
Chromium	14.40	25.7	14.8	12.8	11.1
Lead	1120	2380	359	179	124
Mercury	0.127 J	0.191 J	0.075 J	0.048 J	0.037 J
Selenium	11.7 U	15.40	9.6 U	9.8 U	10.8 U
Silver	1.11	0.70	0.5 U	0.5 U	0.5 U

Table 4.2.3b
East Runoff Area Soil
TCLP Concentrations
(mg/L)

RCRA Metal	SS-009	SS-010	SS-011	SS-012	SS-013
Cadmium	0.19	0.12	N/A	N/A	N/A
Lead	1.41	1.10	N/A	N/A	N/A

N/A = Not analyzed as directed by U.S. EPA Region 5

4.2.4 Background Soil

Background soil results (Table 4.2.4) indicate a notable difference between the concentration of lead in the south wetland area background sample (BK-001) and the residential soil background samples

(BK-002, BK-003). However, no other differences are noted between the three samples or with any of the other RCRA metals.

The south wetland area background sample contained a lead concentration of 112 mg/kg which is two times the mean concentration of the two residential background samples (BK-002, BK-003). It is possible to conclude that the location of BK-001 may have been impacted by surface runoff from the parking lot area. However, the lead concentration in BK-001 is relatively low when compared to the other soil samples (SS-001 through SS-013) and is nearly one-quarter of the IEPA soil clean-up objective. Thus, BK-001 is included in the calculation of the mean soil lead background level and could still be considered a representative background location

Table 4.2.4
Background Soil
Total Metal Concentrations
(mg/kg)

RCRA Metal	BK-001	BK-002	BK-003	Mean
Arsenic	17.9	16.6	15.4	16.6
Barium	193.0	242.0	247.0	227.3
Cadmium	1.82	1.29	1.36	1.49
Chromium	18.6	79.0	16.1	37.9
Lead	112.0	55.5	56.3	74.6
Mercury	0.071 J	0.037 J	0.033 J	0.047 J
Selenium	13.2 U	12.3 U	9.7 U	11.7 U
Silver	0.7 U	0.6 U	0.5 U	0.6 U

4.3 Surface Water and Sediment

Analytical results for the surface water and co-located sediment samples are presented in Table 4.3.1 through Table 4.3.4. The sample results are grouped according to the four areas which were sampled: Long Lake, south wetland area, east runoff area, and the non-contact cooling water pond.

4.3.1 Long Lake

The surface water and sediment sample results (Table 4.3.1) for Long Lake indicate that the sediments of the water body contain high levels of lead and cadmium when compared to background soil samples. However, the surface water samples contained no notable

concentrations of metals, and the sediment samples contain no notable concentrations of arsenic, barium, chromium, mercury, selenium, or silver.

Sediment samples (SD-001, SD-002, SD-003) contain a mean lead concentration of 712 mg/kg which is 10 times greater than the mean lead soil background concentration. All three samples are near or above the 400 mg/kg IEPA Tier 1 Industrial soil clean-up objective for lead.

Sediment samples (SD-001, SD-002, SD-003) contained cadmium concentrations which are notably higher than all soil samples which were collected (Tables 4.2.1, 4.2.2, 4.2.3). The sediment samples contain a mean cadmium concentration of 324 mg/kg, which is 217 times greater than the mean cadmium soil background concentration. All three sediment samples are above the 39 mg/kg IEPA Tier 1 Residential soil clean-up objective for cadmium, but below the 1,000 mg/kg IEPA Tier 1 Industrial soil clean-up objective for cadmium.

Although contaminant concentration comparisons to the various TACO soil remediation values are provided, they may not be appropriate remediation values for sediments. The appropriate remediation standards for the site, considering all necessary site-specific factors, have not been determined at the time of this report.

The surface water samples contained no notable levels of RCRA metals. However, during the sampling event, the water body was observed to be relatively still with no visible flow. The low dissolved oxygen levels (mean 3.8 mg/L) and relatively low turbidity (mean 53 NTU) suggest that there may be minimal mixing and dispersion of sediment contamination which may explain the lower levels of inorganic contamination noted in the surface water samples.

Table 4.3.1
Long Lake
Surface Water and Sediment Total Metal Concentrations

	Surface Water ($\mu\text{g/L}$)			Sediment (mg/kg)		
RCRA Metal	SW-001	SW-002	SW-003	SD-001	SD-002	SD-003
Arsenic	100 U	100 U	100 U	23.9 U	18.9 U	15.2 U
Barium	83.0	78.2	83.8	225	210	239
Cadmium	12.40	9.90	9.40	566	308	98.10
Chromium	10.0 U	10.0 U	10.0 U	14	14.4	16.4
Lead	50.0 U	50.0 U	50.0 U	1100	383	652
Mercury	0.20 UJ	0.20 UJ	0.20 UJ	0.38 J	0.261 J	0.148 J
Selenium	100 U	100 U	100 U	23.9 U	18.9 U	15.2 U
Silver	5.0 U	5.0 U	5.0 U	1.94	0.90 U	1.63

Temperature ($^{\circ}\text{C}$)	24.2	24.9	28.5
Conductivity ($\mu\text{S/cm}$)	0.468	0.485	0.612
Turbidity (NTU)	50	70	40
Dissolved O_2 (mg/L)	3.6	4.0	Not Available
pH	6.89	7.33	8.06

4.3.2 South Wetland Area

The surface water and sediment sample results (Table 4.3.2) for the south wetland area indicate that the area contains high levels of lead and cadmium. However, the surface water and sediment of the area contain no notable concentrations of arsenic, barium, chromium, mercury, selenium, or silver.

The surface water samples (SW-004, SW-005, SW-006) contain a mean lead concentration of 9,194 $\mu\text{g/L}$, and the sediment samples (SD-004, SD-005, SD-006) contain a mean lead concentration of 270 mg/kg , which is nearly four times greater than the mean soil background concentration.

The surface water samples contain a mean cadmium concentration of 291 $\mu\text{g/L}$, which is 27 times the mean cadmium concentration for the surface water samples of Long Lake (mean 10.5 $\mu\text{g/L}$). Cadmium concentrations in sediments were a minimum of three times the mean soil background concentration.

The surface water in this area exhibited high conductivities, which were all above 2.0 $\mu\text{S/cm}$. A relatively high turbidity (337 NTU) is noted for SS-004 and maybe related to the depth of the water at this location (Photo 56).

Table 4.3.2
South Wetland Area
Surface Water and Sediment Total Metal Concentrations

RCRA Metal	Surface Water ($\mu\text{g/L}$)			Sediment (mg/kg)		
	SW-004	SW-005	SW-006	SD-004	SD-005	SD-006
Arsenic	100 U	100 U	153.0	19.1	22.4 U	18.8 U
Barium	1110.0	154.0	2150.0	201.0	246.0	214.0
Cadmium	467.00	54.20	352.00	8.69	6.95	4.65
Chromium	52.1	10.0 U	104.0	18.2	17.0	16.7
Lead	12500.0	481.0	14600.0	298.0	433.0	79.8
Mercury	105 J	0.20 UJ	1.83 UJ	0.057 J	0.102 J	0.07 J
Selenium	100 U	100 U	107.00	17.8 U	22.4 U	14.8 U
Silver	16.5	5.0 U	45.10	0.9 U	1.1 U	0.7 U

Temperature ($^{\circ}\text{C}$)	26.5	28.5	24.7
Conductivity ($\mu\text{S/cm}$)	2.06	2.59	2.06
Turbidity (NTU)	337	24	45
pH	8.22	8.19	8.09

4.3.3 East Runoff Area

The surface water and sediment sample results (Table 4.3.3) for the east runoff area indicate that runoff from the waste slag pile (Photo 62) contains high lead concentrations and relatively high cadmium concentrations when compared to background. However, this area exhibits no notable concentrations of the other RCRA metals.

The lead concentration of 1,490 mg/kg is nearly four times the 400 mg/kg IEPA Tier 1 Industrial soil clean-up objective and nearly 20 times higher than the mean background concentration of 74.6 mg/kg for lead. The cadmium concentration of 8.69 is nearly six times background, however this concentration is well below the 39 mg/kg IEPA Tier 1 Residential soil clean-up objective and 1,000 mg/kg IEPA Tier 1 Industrial soil clean-up objective.

Although contaminant concentration comparisons to the various TACO soil remediation values are provided, they may not be appropriate remediation values for sediments. The appropriate remediation standards for the site, considering all the necessary site-specific factors, have not been determined at the time of this report.

Surface water at this sample location exhibited an extremely high conductivity (20 μ S/cm) and pH (11.7). The high turbidity (181 NTU) may be related to the depth of the water at this location (Photo 62).

Table 4.3.3
East Runoff Area
Surface Water and Sediment Total Metal Concentrations

RCRA Metal	Surface Water (μ g/L)	Sediment (mg/kg)
	SW-008	SD-008
Arsenic	100 U	12.6 U
Barium	494.0	313.0
Cadmium	19.7	8.69
Chromium	82.8	23.8
Lead	4350.0	1490.0
Mercury	3.65 J	0.08 J
Selenium	294.00	12.6 U
Silver	5.0 U	0.6 U
Temperature ($^{\circ}$ C)	20.0	
Conductivity (μ S/cm)	20.8	
Turbidity (NTU)	181	
pH	11.7	

4.3.4 Non-Contact Cooling Water Pond

stormwater canal

The surface water and sediment sample results (Table 4.3.4) for the non-contact cooling water pond indicate high lead and cadmium concentrations. However, the surface water and sediment at this sample location exhibit no notable concentrations of the other RCRA metals.

Surface water at this sample location exhibited an extremely high conductivity (29.5 $\mu\text{S}/\text{cm}$) and pH (10.34). The low turbidity (36 NTU) suggests the high surface water lead and cadmium concentrations may not be related to high suspended solids.

Table 4.3.4
Non-Contact Cooling Water Pond
Surface Water and Sediment Total Metal Concentrations

	Surface Water ($\mu\text{g}/\text{L}$)	Sediment (mg/kg)
RCRA Metal	SW-007	SD-007
Arsenic	100 U	167.0
Barium	76.8	2430.0
Cadmium	405.00	3450.0
Chromium	12.9	110.0
Lead	9040.0	22600.0
Mercury	8.28 J	8.45 J
Selenium	348.00	144 U
Silver	5.0 U	62.80
Temperature ($^{\circ}\text{C}$)	33.6	
Conductivity ($\mu\text{S}/\text{cm}$)	29.5	
Turbidity (NTU)	36	
pH	10.34	

5.0 DATA VALIDATION

5.1 Total Metals Data Validation

No analytical results/data reported for any of the media were rejected during the data validation. A total of 360 analytical results for total metals were reported for the sampling effort. Of these results, 232 were reported at a concentration above the method detection limit, and 128 were reported as undetected (U). Estimated concentrations (J) were identified only for the mercury results.

The samples were analyzed in four sample delivery groups (SDGs). The data packages for the SDGs contained all documentation and data necessary to conduct a complete quality assurance review (e.g., data validation).

Completeness

The results reported by the laboratory were 100-percent complete and legible. No data were rejected and all data are useable as reported.

Holding Times

Analytical holding times were assessed to determine whether the holding time requirements were met by the laboratory. Holding times were met for all analytes, except mercury. All values for mercury were qualified as estimated and flagged "J".

Method Blank Analyses

No analytes were detected in the laboratory or field blanks at concentrations greater than two times the method detection limit.

Calibration

Initial calibration, continuing calibration verification, contract-required detection limit standards, and continuing calibration blank analyses met the criteria for acceptable performance and frequency of analysis for all total metals.

Interference Check Samples for ICP Analyses

All interference check sample results met the criteria for acceptable performance and frequency of analysis.

Accuracy

The accuracy of the analytical results were evaluated in terms of analytical bias by assessing Laboratory Control Samples (LCSs) and matrix spike recoveries and in terms of precision by assessing laboratory duplicates.

Laboratory Control Sample Recoveries

The recoveries for all LCSs and the frequency of analysis met the criteria for acceptable performance.

Matrix Spike Recoveries

The recoveries for all matrix spike samples and the frequency of analysis met the criteria for acceptable performance. For one SDG (SDG G91185), several target analyte results were outside the percentage control limit range and not within criteria acceptance. However, the original sample concentrations in these instances were more than four times the spike concentrations and the sample results did not require qualification.

Precision

The results for all duplicate sample analyses and the frequency of analysis met the criteria for acceptable performance.

Serial Dilution of Samples for ICP Analyses

All serial dilution results for the samples analyses met the criteria for acceptable performance and frequency of analysis.

Analyte Quantification and Method Detection Limits

The calculation for analyte quantification and method detection limits were acceptable for all target analytes.

Field Quality Control

The results for all field quality control samples associated with the sampling effort were acceptable.

Equipment Rinsate Blanks

No target analytes were detected in the field equipment blanks.

Field Duplicates

The precision for field duplicate analysis was acceptable and most of the relative percentage difference results were less than or equal to 35 percent.

Sample Result Verification

Raw data were examined for anomalies, transcription errors, and reduction errors. Sample results were examined for calculation errors to ensure that the reported results were accurate. All reported values were found to be acceptable.

5.2 TCLP Metals Data Validation

No reported data were rejected or qualified during the data validation for the additional analysis requested by U.S. EPA. A total of nine analytical results for TCLP lead and nine analytical results for TCLP cadmium were reported for the sampling effort with all 18 results being reported at a concentration above the method detection limit. The samples were analyzed in one sample delivery group (SDG) with the SDG containing all documentation and data necessary to conduct a complete quality assurance review.

Completeness

The results reported by the laboratory were 100-percent complete and legible. No data were rejected and all data are useable as reported.

Holding Times

Analytical holding times were assessed to determine whether the holding time requirements were met by the laboratory. Holding times were met for all analytes.

Method Blank Analyses

No analytes were detected in the laboratory or field blanks at concentrations greater than two times the method detection limit.

Calibration

Initial calibration, continuing calibration verification, contract-required detection limit standards, and continuing calibration blank analyses met the criteria for acceptable performance and frequency of analysis for all total metals.

Interference Check Samples for ICP Analyses

All interference check sample results met the criteria for acceptable performance and frequency of analysis.

Accuracy

The accuracy of the analytical results were evaluated in terms of analytical bias by assessing Laboratory Control Samples and matrix spike recoveries and in terms of precision by assessing laboratory duplicates.

Laboratory Control Sample Recoveries

The recoveries for all LCSs and the frequency of analysis met the criteria for acceptable performance.

Matrix Spike Recoveries

The recoveries for all matrix spike samples and the frequency of analysis met the criteria for acceptable performance. Results of matrix spike and matrix spike duplicate were outside the percentage control limit range and not within criteria acceptance. However, the original sample concentrations in these instances were greater than four times the spike concentrations. Therefore, the results did not require qualification.

Precision

The results for all duplicate sample analysis and the frequency of analysis met the criteria for acceptable performance.

Serial Dilution of Samples for ICP Analyses

All serial dilution results for the samples analyses met the criteria for acceptable performance and frequency of analysis.

Analyte Quantification and Method Detection Limits

The calculation for analyte quantification and method detection limits were acceptable for all target analytes.

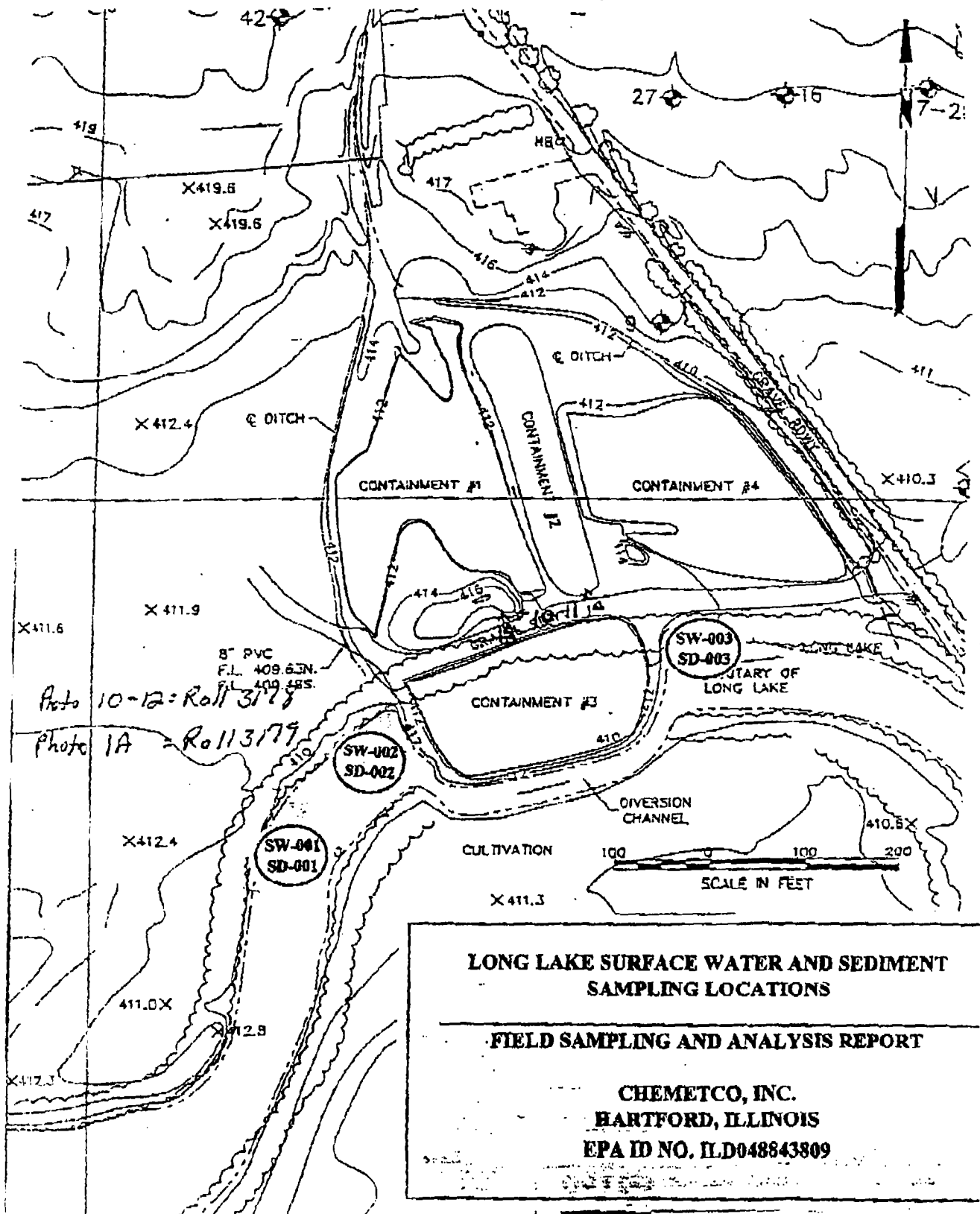
Field Quality Control

The results for all field quality control samples associated with the sampling effort were acceptable.

APPENDIX A
FACILITY LAYOUT AND SAMPLE LOCATIONS

FIELD SAMPLING AND ANALYSIS REPORT

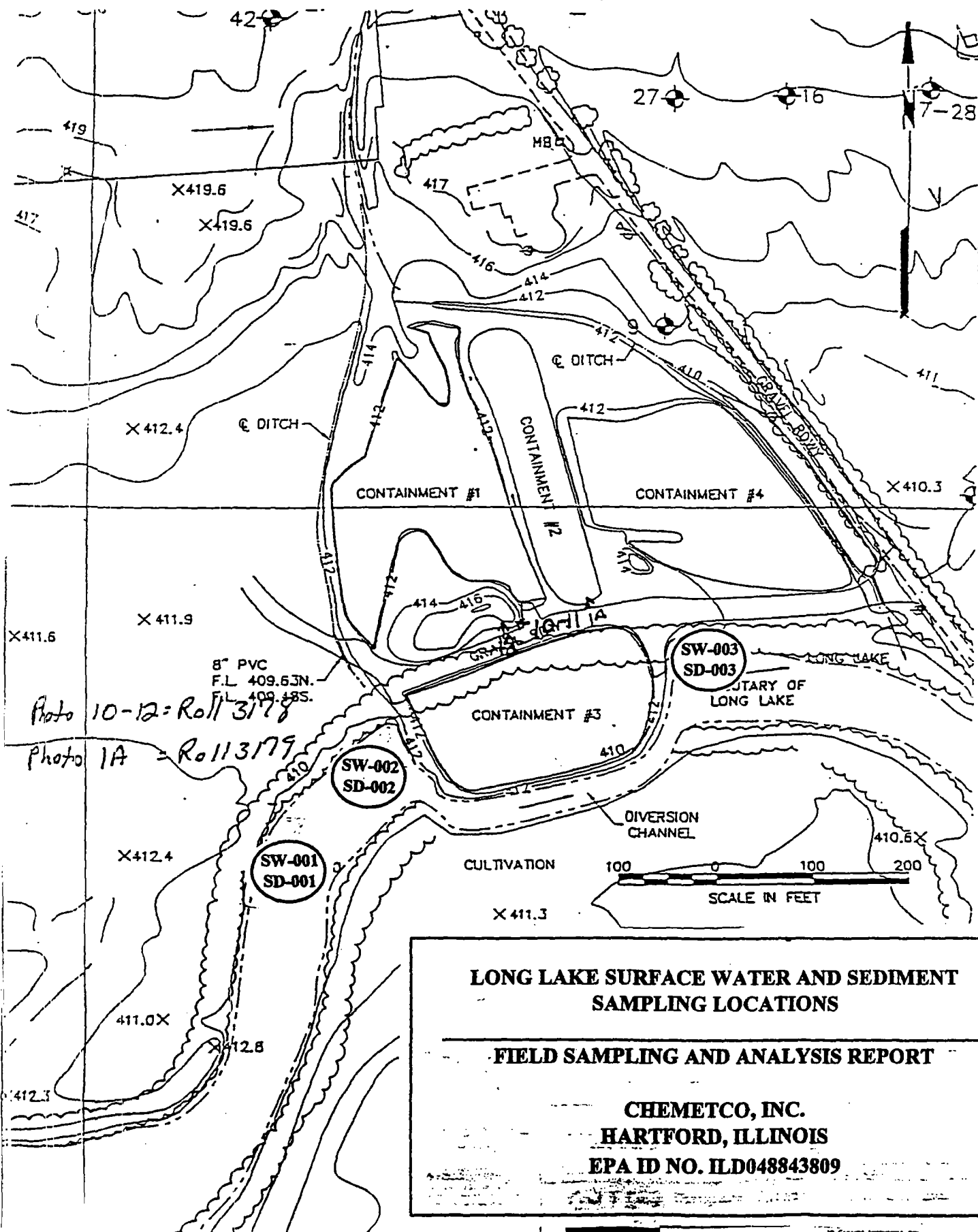
CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809



LONG LAKE SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

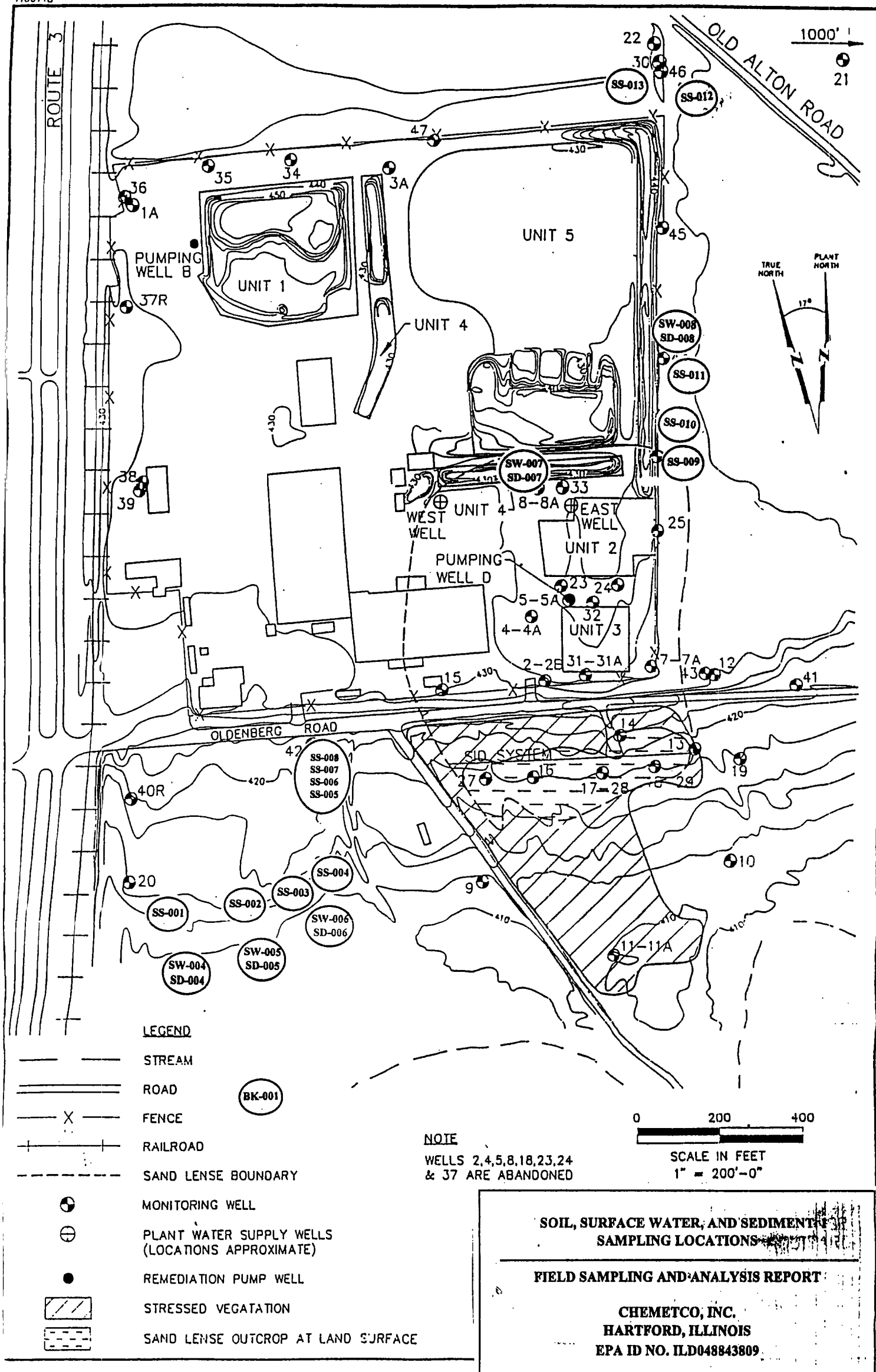


LONG LAKE SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS

FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809

1100718



APPENDIX B

PHOTOGRAPH LOG

FIELD SAMPLING AND ANALYSIS REPORT

**CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809**



Photo No.: 1
Logbook Photo No.: 1-9
Date: May 28, 1998

Time: 1706
Direction: North

Description: View showing area from which slag sample SL-001 was collected. Slag Hopper with conveyors is visible in background.



Photo No.: 2
Logbook Photo No.: 1-10
Date: May 28, 1998

Time: 1720
Direction: North

Description: View showing area from which slag sample SL-002 was collected. Slag Hopper with conveyors is visible in background.



Photo No.: 3
Logbook Photo No.: 1-11
Date: May 28, 1998

Time: 1731
Direction: North

Description: Overview of pit from which slag sample SL-003 was collected. The sample was collected from darker portions of the pile to the right side of the photograph.



Photo No.: 4
Logbook Photo No.: 1-12
Date: May 28, 1998

Time: 1745
Direction: South

Description: View of slag pile area from which slag sample SL-004 was collected.



Photo No.: 5
Logbook Photo No.: 2-21
Date: May 29, 1998

Time: 1208
Direction: NA

Description: View of slag sampling location SL-006. Sample was collected from area located approximately one foot to the upper right of stainless-steel bowl.



Photo No.: 6
Logbook Photo No.: 2-16
Date: May 29, 1998

Time: 1046
Direction: NA

Description: View of slag sampling location SL-007.



Photo No.: 7

Logbook Photo No.: 2-18

Date: May 29, 1998

Time: 1106

Direction: West

Description: View of slag sampling location SL-008. Sample was collected in excavated area.



Photo No.: 8
Logbook Photo No.: 1-17
Date: May 29, 1998

Time: 1045
Direction: South

Description: Overview of the area from which slag samples SL-007, SL-008, SL-015, and SL-016 were collected. Facility back hoe was used to excavate areas for sample collection.



Photo No.: 9

Logbook Photo No.: 1-22

Date: May 29, 1998

Time: 1242

Direction: West

Description: View of slag sampling location SL-009 located in excavated area. TechLaw personnel are shown collecting composite sample of slag material from three sides of the excavated area.



Photo No.: 10
Logbook Photo No.: 1-23
Date: May 29, 1998

Time: 1248
Direction: South

Description: View of slag sampling location SL-010 identified by orange flag.



Photo No.: 11

Logbook Photo No.: 1-21

Date: May 29, 1998

Time: 1230

Direction: West

Description: View of slag sampling location SL-011 identified by orange flag directly right of stainless-steel bowl. TechLaw personnel are preparing to collect sample with stainless-steel auger and stainless steel bowl.



Photo No.: 12
Logbook Photo No.: 2-22
Date: May 29, 1998

Time: 1213
Direction: West

Description: View of slag sampling location SL-013 (upper flag) and SL014 (lower flag).



Photo No.: 13
Logbook Photo No.: 2-17
Date: May 29, 1998

Time: 1057
Direction: NA

Description: View of slag sampling location SL-015 located within excavated area.



Photo No.: 14
Logbook Photo No.: 2-19
Date: May 29, 1998

Time: 1115
Direction: East

Description: View of slag sampling location SL-016 located within excavated area.



Photo No.: 15

Logbook Photo No.: 1-18

Date: May 29, 1998

Time: 1123

Direction: Northeast

Description: View of excavating equipment at slag sampling location SL-017.



Photo No.: 16
Logbook Photo No.: 1-19
Date: May 29, 1998

Time: 1142
Direction: Northwest

Description: View of excavation equipment at slag sampling location SL-018.



Photo No.: 17
Logbook Photo No.: 2-20
Date: May 29, 1998

Time: 1153
Direction: West

Description: View of slag sampling locations SL-018, SL-019, and SL-020. SL-018 is visible as far-left excavation; SL-019 is visible as center excavation; and SL-020 is visible as far-right excavation. Sampling locations are identified with orange flags.

Missing B-19 thru B-24



Photo No.: 18
Logbook Photo No.: 1-20
Date: May 29, 1998

Time: 1142
Direction: Northwest

Description: Overview of area from which slag samples SL-019 and SL-020 were collected. The orange flag in the foreground marks the location from which SL-020 was collected while the flag (barely visible) in the background marks the sampling location for SL-019.



Photo No.: 25

Logbook Photo No.: 2-13

Date: May 29, 1998

Time: 0855

Direction: South

Description: View of zinc oxide sampling location ZO-003 in the Zinc Oxide Storage.



Photo No.: 26
Logbook Photo No.: 3-4
Date: May 29, 1998

Time: 0953
Direction: Northeast

Description: View of front-end loader carrying fresh zinc oxide waste from the filter press from which zinc oxide sample ZO-004 was collected.



Photo No.: 27

Logbook Photo No.: 3-5

Date: May 29, 1998

Time: 0955

Direction: North

Description: View of zinc oxide sampling location ZO-004 in the bucket of the front-end loader. Sample container visible in bucket.



Photo No.: 28
Logbook Photo No.: 3-9
Date: May 29, 1998

Time: 1025
Direction: Southeast

Description: View of No. 1 Baghouse dust collection receptacle from which baghouse dust sample BD-001 was collected.



Photo No.: 29
Logbook Photo No.: 3-6
Date: May 29, 1998

Time: 1015
Direction: Northwest

Description: View of No. 2 Baghouse, also known as the Roof Baghouse, from which baghouse dust sample BD-002 was collected.



Photo No.: 30
Logbook Photo No.: 3-7
Date: May 29, 1998

Time: 1015
Direction: North

Description: View of No. 2 Baghouse, also known as the Roof Baghouse, from which baghouse dust sample BD-002 was collected.



Photo No.: 31
Logbook Photo No.: 3-8
Date: May 29, 1998

Time: 1015
Direction: Northwest

Description: View of No. 2 Baghouse, also known as the Roof Baghouse, from which baghouse dust sample BD-002 was collected. Sample was collected from baghouse "apartment" visible on far-left portion of photograph.



Photo No.: 32
Logbook Photo No.: 3-10
Date: May 29, 1998

Time: 1030
Direction: South

Description: View to the west of the Slag Granulation Plant.



Photo No.: 33

Logbook Photo No.: 3-11

Date: May 29, 1998

Time: 1045

Direction: Northeast

Description: View of Primary Baghouse for the Slag Granulation Plant from which baghouse dust sample BD-003 was collected. Sample collected from baghouse dust collection receptacle visible as green dumpster in photograph.



Photo No.: 34
Logbook Photo No.: 3-12
Date: May 29, 1998

Time: 1045
Direction: Northwest

Description: View of baghouse dust collection receptacle from which baghouse dust sample BD-003 was collected.

B-34



Photo No.: 35

Logbook Photo No.: 3-13

Date: May 29, 1998

Time: 1100

Direction: Southwest

Description: View of sample collection port from the Secondary Baghouse for the Slag Granulation Plant from which baghouse dust sample BD-004 was collected.



Photo No.: 36
Logbook Photo No.: 1-24
Date: May 29, 1998

Time: 1430
Direction: Northeast

Description: View of bagged refractory brick sample RB-001. Sample was collected from brick sample obtained from pile located on the left portion of the photograph.



Photo No.: 37

Logbook Photo No.: 1-25

Date: May 29, 1998

Time: 1440

Direction: West

Description: View of refractory brick sample RB-002 visible as pieces of brick visible in center of photograph. Refractory brick pile visible in background.



Photo No.: 38
Logbook Photo No.: 2-24
Date: May 29, 1998

Time: 1440
Direction: NA

Description: View of refractory brick sample RB-003 visible as pieces of brick in center of photograph.



Photo No.: 39
Logbook Photo No.: 1-26
Date: May 29, 1998

Time: 1450
Direction: West

Description: View of refractory brick sample RB-004 visible as pieces of brick in lower-center portion of photograph. Chisel used to break the brick is visible resting on the brick sample.



Photo No.: 40
Logbook Photo No.: 1-27
Date: May 29, 1998

Time: 1453
Direction: West

Description: View of refractory brick sample RB-005 visible as pieces of brick in center of photograph. Hammer used with chisel to break brick is visible in photograph.

B-40



Photo No.: 41

Logbook Photo No.: 2-1

Date: May 28, 1998

Time: 1002

Direction: Southwest

Description: View of soil sampling location SS-001 identified with orange flag in center of photograph.

B-41



Photo No.: 42
Logbook Photo No.: 2-2
Date: May 28, 1998

Time: 1034
Direction: Southwest

Description: View of soil sampling location SS-002 identified with orange flag in center of photograph.



Photo No.: 43

Logbook Photo No.: 2-3

Date: May 28, 1998

Time: 1044

Direction: Southwest

Description: View of soil sampling location SS-003 identified with orange flag in center of photograph.



Photo No.: 44
Logbook Photo No.: 2-4
Date: May 28, 1998

Time: 1110
Direction: Southwest

Description: View of soil sampling location SS-004 identified with orange flag in center of photograph.



Photo No.: 45

Logbook Photo No.: 2-5

Date: May 28, 1998

Time: 1125

Direction: West

Description: View of soil sampling location SS-005 identified with orange flag in bottom-right portion of photograph.



Photo No.: 46

Logbook Photo No.: 2-6

Date: May 28, 1998

Time: 1134

Direction: South

Description: View of soil sampling location SS-006 identified with orange flag in center of photograph.

B-46



Photo No.: 47

Logbook Photo No.: 2-7

Date: May 28, 1998

Time: 1145

Direction: East

Description: View of soil sampling location SS-007 identified with orange flag in right-center portion of photograph.



Photo No.: 48
Logbook Photo No.: 2-8
Date: May 28, 1998

Time: 1156
Direction: North

Description: View of soil sampling location SS-008 visible as disturbed soil area located approximately one foot to the right of tan storage tote.



Photo No.: 49

Logbook Photo No.: 1-13

Date: May 28, 1998

Time: 1825

Direction: West

Description: View of soil sampling location SS-009 identified with orange flag in center of photograph.



Photo No.: 50
Logbook Photo No.: 1-14
Date: May 28, 1998

Time: 1827
Direction: North

Description: View of soil sampling location SS-010 identified with orange flag to the right of the surface water in the lower-left portion of the photograph.



Photo No.: 51
Logbook Photo No.: 1-15
Date: May 28, 1998

Time: 1840
Direction: West

Description: View of soil sampling location SS-011.



Photo No.: 52
Logbook Photo No.: 2-9
Date: May 28, 1998

Time: 1855
Direction: Southwest

Description: View of soil sampling location SS-012 located northeast of the facility. Sample collected from disturbed soil area visible in center of photograph. Chemetco facility fence is visible in background.



Photo No.: 53

Logbook Photo No.: 1-1

Date: May 28, 1998

Time: 1016

Direction: Southeast

Description: View of area within Long Lake from which surface water sample SW-001 and co-located sediment sample SD-001 were collected.



Photo No.: 54
Logbook Photo No.: 1-2
Date: May 28, 1998

Time: 1107
Direction: Southeast

Description: View of area within Long Lake from which surface water sample SW-002 and co-located sediment sample SD-002 were collected.



Photo No.: 55

Logbook Photo No.: 1-4

Date: May 28, 1998

Time: 1210

Direction: South

Description: View of area within Long Lake from which surface water sample SW-003 and co-located sediment sample SD-003 were collected.



Photo No.: 56
Logbook Photo No.: 1-5
Date: May 28, 1998

Time: 1357
Direction: Northeast

Description: View showing area from which the surface water sample SW-004 and co-located sediment sample SD-004 were collected in the wetland area to the south of the facility.



Photo No.: 57

Logbook Photo No.: 1-6

Date: May 28, 1998

Time: 1440

Direction: West

Description:

View showing area from which the surface water sample SW-005 and co-located sediment sample SD-005 were collected in the wetland area to the south of the facility. Samples were collected from area identified with orange flag in the left-center portion of the photograph.



Photo No.: 58
Logbook Photo No.: 1-7
Date: May 28, 1998

Time: 1523
Direction: East

Description: View showing area from which the surface water sample SW-006 and co-located sediment sample SD-006 were collected in the wetland area to the south of the facility.



Photo No.: 59

Logbook Photo No.: 3-1

Date: May 28, 1998

Time: 1710

Direction: East

Description: View showing facility's stormwater and non-contact cooling water pond from which surface water sample SW-007 and co-located sediment sample SD-007 were collected.



Photo No.: 60
Logbook Photo No.: 3-2
Date: May 28, 1998

Time: 1711
Direction: Southwest

Description: View showing facility's stormwater and non-contact cooling water pond located directly west of sample locations SW-007 and SD-007.



Photo No.: 61

Logbook Photo No.: 3-3

Date: May 28, 1998

Time: 1711

Direction: Southeast

Description: View showing facility's stormwater and non-contact cooling water pond (left) from which samples SW-007 and SD-007 were collected.

B-61



Photo No.: 62
Logbook Photo No.: 1-16
Date: May 28, 1998

Time: 1850
Direction: West

Description: View showing area from which the surface water sample SW-008 and co-located sediment sample SD-008 were collected in a slag pile runoff area to the east of the facility. Samples were collected in area identified with orange flag in center of photograph. Slag is visible pressing against the facility's fence in the background. Visible surface water flow from the slag pile is seen in the background. Horiba Water Quality Checker is visible in foreground.



Photo No.: 63

Logbook Photo No.: 1-3

Date: May 28, 1998

Time: 1135

Direction: Southeast

Description: View of area from which background soil sample BK-001 was collected in the wetland area south of the facility.



Photo No.: 64
Logbook Photo No.: 2-25
Date: May 29, 1998

Time: 1610
Direction: South

Description: View of area from which background soil sample BK-002 was collected in the yard of residence located to the south of the facility.



Photo No.: 65
Logbook Photo No.: 2-26
Date: May 29, 1998

Time: 1620
Direction: South

Description: View of area from which background soil sample BK-003 was collected in the yard of residence located to the south of the facility.



Photo No.: 66
Logbook Photo No.: 1-8
Date: May 28, 1998

Time: 1610
Direction: East

Description: View of collection of equipment blank sample SD-306 from decontaminated, stainless-steel, hand auger head. Deionized water is being poured over the auger head and collected in a 1-liter, plastic container for RCRA total metals analyses.

APPENDIX C

FIELD LOGS

FIELD SAMPLING AND ANALYSIS REPORT

**CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809**

IF FOUND PLEASE RETURN TO:

NAME _____

COMPANY _____

STREET _____

CITY _____ STATE _____ ZIP _____

PHONE _____

FORESTRY SUPPLIES
49365



JOB BOOK

FROM PENINSULAR PUBLISHING

PROJECT NAME Chemetros, Altamira

PROJECT NUMBER _____

CREW Anthony, Mubira, Teeklan

DATE 05/28/98 BOOK # 1 OF _____

WEATHER Sunny, 69°F at 6:00pm

FIELD BOOK

16 PAGE

8 LEAVES

50% RAG

Logbook No. 1

CURVE FORMULAS

$$\begin{array}{l|l|l} T = R \tan \frac{1}{2} I & R = T \cot \frac{1}{2} I & \text{Chord def.} = \frac{\text{chord}^2}{R} \\ T = \frac{50 \tan \frac{1}{2} I}{\sin \frac{1}{2} I} & R = \frac{50}{\sin \frac{1}{2} I} & \text{No. chords} = \frac{I}{D} \\ \sin \frac{1}{2} D = \frac{50}{R} & E = R \text{ ex. sec } \frac{1}{2} I & \text{Tan. def.} = \frac{1}{2} \text{ chord def.} \\ \sin \frac{1}{2} D = \frac{50 \tan \frac{1}{2} I}{T} & E = T \tan \frac{1}{2} I & \end{array}$$

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve, very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.) and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

GENERAL DATA

RIGHT ANGLE TRIANGLES. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. $10.10^2 \div 200 = .5$; $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. $25.25^2 \div 200 = 3.125$; $100 - 3.125 = 96.875 = \text{Base}$.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

LEVELING. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574 d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{1}{3} d^2$. The combined correction is negative.

PROBABLE ERROR. If d_1, d_2, d_3 , etc. are the discrepancies of various results from the mean, and if $\sum d^2$ = the sum of the squares of these differences and n = the number of observations, then the probable error of the mean =

$$\pm 0.6745 \sqrt{\frac{\sum d^2}{n(n-1)}}$$

MINUTES IN DECIMALS OF A DEGREE

1'	.0187	11'	.1833	21'	.3500	31'	.5167	41'	.6833	51'	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

INCHES IN DECIMALS OF A FOOT

1-10	3-32	$\frac{1}{8}$	3-16	$\frac{1}{4}$	5-16	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
.0052	.0078	.0101	.0150	.0208	.0260	.0313	.0417	.0521	.0625	.0729
1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

Chemsted

(1)

0710: Arrive at facility with

John Koehn (TechLaw)
Kevin Hagan (TechLaw)
P. Kueffler (U.S. EPA)
Doug Updike (TechLaw)
Anthony Mubia (TechLaw)

0727: Check in at the facility reception/security area, where we were reviewed by Ms. Heather Young (Chemsted).

* Also in attendance was Ms. Cindy S. Davis (CSD Envtl. Svcs.)

0735: Opening mtg. led by Heather Young / P. Kueffler to discuss the sampling plan/agenda

0745: End of opening mtg.

Am, 05/28/98

0817: Got to the designated
decontamination station/area.

* Off-loaded drums to be
used for Spring IDW.

0830: Begin determining sampling
locations.

0930: Prepare to begin actual sampling
breaks up into 2 teams.

Kevin Higgins } one team taking
Anthony Mubiru } background, surface
water & sediment
samples

Doug Epdike } other team taking
John Keenen } mostly soil samples.

1011: Begin sample collection.

AM, 05/26/96

Photo #1	Time	
Camera #1		
Camera #1		
Photo #1	Time Taken	Direction
SW-1/SD-1 Photo #1	1016	South East
SW-2/SD-2 Photo #2	1107	S-East
BK-1 Photo #3	1135	S-East
SW-3/SD-3 Photo #4	1210	South
SW-4/SD-4 Photo #5	1357	N-East
SW-5/SD-5 Photo #6	1440	West
SW-6/SD-6 Photo #7	1523	East
SD-306 Photo #8	1610	East
AM, 05/28/96		

Sample # Sample Location	Field Measurement (4) Time Collected
SW-1	1015 hours pH = 6.89 Cond = 0.468 mS cm ⁻¹ Turbidity = 50 NTU D.O = 3.6 mg/L Temp = 24.2 °C
SW-1 (MS/MSD)	1020
SW-1 (MS/MSD)	
SW-1 (MS/MSD)	
SW-1 (Metals)	
SD-001	
SD-001 (MS/MSD)	1032
SD-001 (MS/MSD)	
SD-001 (MS/MSD)	
Am, 05/28/98	

Sample # Sample Location	Field Measurement (5) Time Collected
SW-2	1110 pH = 7.33 Cond = 0.485 mS cm ⁻¹ Turbidity = 70 NTU D.O = 2.00 mg/L Temp = 24.9 °C
SW-2 (Metals)	1115
SW-2 (Metals)	
Am, 08/28/98	
SD-2 (Metals)	1120
SW-3	1210 pH = 8.06 Cond = 0.62 mS cm ⁻¹ Turbidity = 40 NTU D.O = 11.3 mg/L Temp = 28.5 °C
Am, 05/28/98	
SW-3 (Metals)	
SW-3 (Metals)	
SD-3 (Metals)	1220
Am, 25/28/98	

Returned from lunch break

(6)

Sample #s & Field Measurements & Times Collected

SW-1

AM, 05/28/98

1400 hours
 pH = 8.22
 Cond = 2.06 mScm⁻¹
 Turbidity = 337 NTU
 D.O = 11.5 mg/L
 Temp = 26.5 °C
 Cond = 2.06 mScm⁻¹

SD-1

1410

SW-5

AM, 05/28/98

pH = 8.19
 Cond = 2.59 mScm⁻¹
 Turbidity = 24 NTU
 D.O = 11.5 mg/L
 Temp = 28.5 °C

SW-5

1445

SD-1

1500

AM, 05/28/98

Sample #s & Field Measurements & Times Collected

SW-6 Collected at

1530

pH = 8.09
 Cond = 2.06 mScm⁻¹
 Turbidity = 45 NTU
 D.O = 10.5 mg/L
 Temp = 24.0 °C

SD-6

Collected at 1545

1650: Got to area where the
 Slag samples were
 Collected.

SL-001

1707

SL-002

1720

SS-10

1830

AM, 05/28/98
 SW-8

Collected at
 pH = 11.17
 Cond = 20.8 mScm⁻¹
 Turbidity = 121 NTU
 D.O = 11.1 mg/L
 Temp = 19.3 °C

Photo #	Direction	Time taken (8)
Photo #9 SL-001	North	1706
SL-002 Photo #10	N	1720
SL-003 Photo #11	N	1731
SL-004 Photo #12	S	1745
SS-9 Photo #13	W	1828
SS-10 ^{Photo #14}	N	1827
SS-11 ^{Photo #15}	W	1840
SW-8 / SED-8 Photo #16	W	1850

AM, 05/28/98

1940: leave the site for the day

AM, 05/28/98

0720: Arrive at plant, sign in. (10)

Photo #	Time taken	Direction
17 Overview photo	1045	S
Photo # 17 was taken in the area from which slag samples SL-007 & SL-015 & SL-008, SL-016 were collected. AM, 06/29/98		
Photo # 18 shown collecting sample SL-017	1123	NEast
Photo # 19 SL-018	1142	N. West
Photo # 20 Flag in background → location for SL-019 Flag in foreground → " " SL-020. Flags are orange in colour	1142	N. West
Photo # 21 SL-011	1230	West
Photo # 22 SL-009	1242	South
Photo # 23 SL-010	1248	South

Sample #

SL-007

SL-015

SL-008

SL-016

SL-017

SL-018

SL-019

SL-020

SL-006

SL-013

SL-014

SL-012

SL-009

SL-010

Time Collected (11)

1046 (by JK)

1057

1106

1115

1123

1150

1208

1214

1213

1225

1242

1248

Completed collecting slag samples at 1255. Prepared to leave slag collection area immediately thereafter. → Time of leaving slag collection area ≈ 1307

Break for lunch at ≈ 1310

AM, 06/29/98

Photo #	Time taken	Direction ⁽¹²⁾
Photo #24 RB-001	1430	NEast
Photo #25 RB-002	1440	West
Photo #26 RB-004	1450	West
Photo #27 RB-005	1453	N. West

Sample #	Time Collected ⁽¹³⁾
1350: Return from lunch break.	
1410: Break up into 2 teams, viz: Doug Updike - Decontaminating Used Equipment	
Pat. K (EPA) John Koehn Kevin Higgins Chris (IEPA) Anthony M.	Collection of Brick Samples
RB-001	1430
RB-002	1435
RB-003	1440
RB-004	1445
RB-005	1450
RB-006	1505
1508: Completed refractory brick sample collection.	
AM 105/29/98	

Sample #	Time Collected (14)
BK-002	1610
BK-003	1625

1645. Left site for the day.

This image shows a full page of blank graph paper. The grid consists of small squares formed by thin black lines. A single vertical line runs down the center of the page, dividing it into two equal halves. In the top right corner, there is a handwritten mark that appears to be the number "10" enclosed in a circle. The rest of the page is empty and ready for use.

CSD Environmental
Services, Inc.

2220 Yale Blvd.
Springfield, Illinois 62703
217/522-4085
FAX 217/522-4087

Cindy S. Davis
President

CSD Environmental
Services, Inc.

2220 Yale Blvd.
Springfield, Illinois 62703
217/522-4085
FAX 217/522-4087

Cindy S. Davis
President

"Outdoor writing products for outdoor writing people"



This cover is made of 100%
post-consumer recycled material.

"Rite in the Rain" - A unique All-Weather Writing paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather.

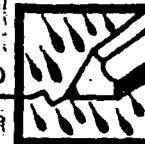
Available in a variety of standard and custom printed case-bound field books, loose leaf, spiral and stapled notebooks, multi-copy sets and copier papers.

"Rite in the Rain" All-Weather Writing papers are also available in a wide selection of rolls and sheets for printing and photocopying.

a product of

J. L. DARLING CORPORATION
Tacoma, WA 98424-1017 USA
(253) 922-5000 • FAX (253) 922-5300
www.riteintherain.com

"Rite in the Rain®"



ALL-WEATHER
LINE RULE
Spiral Notebook

CHEMETCO

JOHN KOENIGEN-TECHLAW

No. 393N
32 Sheets
4 3/8" x 7"
Numbered Pages

Logbook No. 2



Name JOHN KOEHNEN
TECHLAW, INC.
Address 20 N. WACKER DR. #1260
CHICAGO, IL 60606
Phone (312) 345-8938
Project CHEMETCO - SAMPLE
COLLECTION ACTIVITIES.

"Rite in the Rain" - a unique all-weather writing surface created to shed water and to enhance the written image. Makes it possible to write sharp, legible field data in any kind of weather.

a product of

J. L. DARLING CORPORATION
TACOMA, WA 98424-1017 USA

[illegible]

•

PERSONNEL:

WEATHER: WARM $\approx 75^{\circ}\text{F}$
W/ MOD HUMIDITY & PATCHY
CLOUDS.

- INITIATE KICK OFF MTG.
- PR/KH DISCUSS SCOPE OF ACTIVITIES & REG-REQ

5/28/98

OK

0730 PK INIT DISCUSSION OF
SUGGESTED ACTIVITIES.

CHEMETCO SPLITS: SW/SEO
BRICK, SLAB.

- NOT ZINC OXIDE, BA DUST.
- CSD IS FACILITY
CONSULTANT & COMPANY
OWNER. HEATHER YOUNG
EMPLOYEE OF CSD.

0850 MTG WRAP UP. PROCEED
TO FIELD AREA, (TOE A
RET PONDS) AND SCOPE OUT
SAMPLING AREAS. KH &
AM WILL SAMPLE SEPS &
SW & COLLECT BEG BOIL.
TK & DO WILL SAMP SOILS
& BRICK AREA.

GNC

5/28/98

0958 ARRIVE AT SSO1

SAMPLING LOC PREP TO
INIT SAMPLING. WILL COLL
MS/MSD & DUP

1002 INIT SAMPLING AT
LOC: SSO1
Camera 2 KH TK USING CAMERA #2

PHOTO TK2-1 FACING

WSW AT SAMP INIT AX

LOC. SOIL MATRIX IS
SLAB/SOIL MIX, DARK
BROWN/GREY. LOOSE CONSOL

1016 SAMP COMPLETE. CHEMETCO
SPLITS w/ DUP.

5/28/98

JK

1025 INIT SAMPLING

AT SS002. SAMPLE

MAT IS DARK BROWN/BLK
W/ GRAVEL & SLAG INTER

MIXED. CHEMETCO SPLITS
SAMPLE

1034 PHOTO JK2-2

FACING SW AT COMP

SAMPLE LOC 002. LOC IS

APPROX 20' OFF GRAVEL

FLAID ^{TO SOUTH} & 20' OFF OF TDE

OF SLAG/COIL AREA. TO WEST

JK

5/28/98

1037 INIT SAMPLING

AT SS003. MAT IS MOSTLY

DRY SAND & GRAVEL

MED TO DARK BROWN
- CHEMETCO SPLITS

1044 COMPLETE AT SS003

PHOTO JK2-3 FACING

SW AT SAMP LOC W/IN

SMALL GROUP OF SHRUBS
LOC ~ 20' OF GRAVEL RD

1102 INIT SAMP AT

SS004. MAT IS MED GRAY
SLAB/COIL MIX
CHEMETCO SPLITS

5/28/98

OK

1110 PHOTO JK2-4 OF
SS004 SAMP LOCATION
AT "TOE" OF DRIVEWAY

- COMPLETE, MOVE TO NEXT
LOC. THIS LOC IS AT
END OF TOE & WETLAND
AREA

1117 INIT SAMPLING OF
SS005 LOC AT FORMER
BRICK AREA. SOIL IS
MOIST SILTY SAND. DARK-
CHEMETCO SPLITS

5/28/98

OK

1125 PHOTO JK2-5
FACING W AT SAMP

LOC SS005. THIS LOC IS
EASTERNMOST SAMP LOC
(OF 4) WITHIN FORMER
BRICK AREA, EAST OF
MAIN PLANT ROAD.

1129 INIT SAMPLING
AT SS006, MAT IS

DARK BROWN SILTY SAND
W/ POT OIL BASED
SUPPRESSANT. CHEMETCO
SPLITS

1134 PHOTO JK2-6
FACING S AT SAMP LOC

5/28/98

OK

1135 MOVE TO NEXT SAMP

LOC. SS007.

1138 INIT SAMPLING

AT SS007. MAT IS

A MOIST SILTY CLAY

DARK BROWN, CHEMETCO
SPITS

1145 PHOTO JKZ-7

FACING E AT SS002

LOC IS APPROX 50' EAST

OF MAIN FACILITY ACCESS

ROAD.

OK

5/28/98

9

1148 INIT SAMP AT

SS008. MAT IS DARK

BROWN SILTY SAND

W/ MOD ORGANIC MAT

& SLIGHTLY MOIST.

CHEMETCO SPLITS.

1156 PHOTO JKZ-8 FACING

N AT SS008, SOIL SAMP

COMPLETED RETURN TO VEHICLES

SED SAMP OK, 3 SAMPLES

COLLECTED W/ SW AS WELL

AS 1 SOIL BKGD.

5/28/98

C.D.K.

1222 AT VEHICLES AWAITING

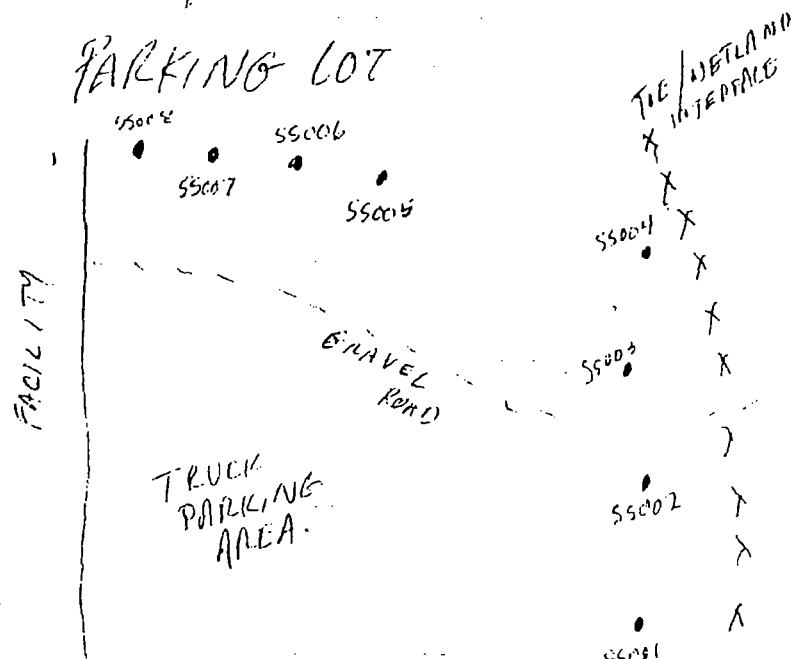
COMPLETION OF SED DOF.

DISCUSS. REM SAMP W/ PK.

WILL LIKELY SAMPLE 3

SED/SW LOC AT TO OFF

PARKING LOT



* APPROX SOIL SAMP LOCs

Y.R.

5/28/98

1300 SED SAMPLING &

SW WRAPPING UP W/IN

WETLAND / CONT BASIN &

CREEK. BREAK FOR

LUNCH, OFF SITE.

1400 RET FROM LUNCH

& PROCEED TO TRUCK

PARKING AREA & SET

UP TO SAMPLE SEDs

& SW AT LOC EAST OF

TOE. SAMP LOCATIONS

ARE APPROX 15' EAST

OF TOE DIP.

5/28/98

YAK-

5/28/98

OK

5/28/98

1900 JK PREP DECON/
STAGING AREA. WILL
LIKELY GO TO SLAB
PILE & OFFSITE AREA
TO NORTH PORTION OF
FACILITY. PK, HY & JK
REL POT SAMPLING LOGS
& TYPES OF MAT THAT
WOULD/SHOULD BE SAMPLED.
SET OUT PRELIMINARY LOCs
FOR FINE SLAB. WILL
BETTER DEFINE SAMP
LOCs LATER.

1707 IN IT SAMPLING

AT SLAB AREA. SAMPLE
COLL AS SL 001 WITH
MS/MSD AND DUPLICATE
SL 101.

SAMPLE AREA DIV INTO

3 SECTIONS. SAMP COLL
FROM TOP & BOTTOM

W/ 5-6 SCOOPS FROM
EACH AREA. MAT IS THEN
COMP/HAND & THE SAMP
CONTAINER(S) FILLED.

(HEMETLO SPLITS

5/28/98

JJK

1719 SET UP AND
 SAMPLE AT SL-002
 SAMP FOR METALS ONLY
 CHEMBICO SLIPS, MAT
 IS FINE DARK BLACK/
 GREY SLAG

1730 IN IT SAMPLING
 OF SL-003. LOC IS
 WITHIN EXC AREA
 WITH SLAG FED BY
 CONVEYORS. SAMP IS
 MED/COARSE SLAG ($\approx 1/4"$)
 DARK GREY/BLACK

JJK

5/28/98

1745 IN IT SAMPLING
 AT SL-004. SLAG MAT
 VARIES IN SIZE FROM
 $\approx 1"$ TO $4"$ PIECES.

~~X~~ PROC DEVIATION. DUE TO
 INABILITY TO REDUCE

PARTICLE SIZE IN FIELD,

THE SAMPLE MAT WOULD
 NOT FIT IN 802 JAR

HENCE A ZIPLOC BAG
 WAS USED AS A SAMPLE
 CONTAINER ~~X~~

5/28/98

J/L

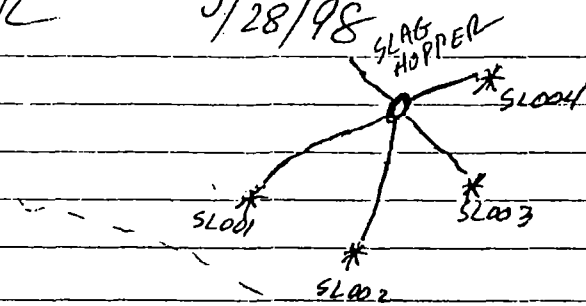
1750 PROCEED TO RET
TO EACH SAMPLE LOC &
COLLECT 3 SCOOPS FROM
EACH LOC, TO BE COMP
& HOMOG INTO ONE COMP
SAMPLE.

1752 INIT COLLECTION
OF SLOOS, SLOOS IS
A COMPOSITE OF ALL
OTHER LOCs, MOST
INIT IS FINE TO MED
GRAIN SLAG W/ SOME
LARGE SIZES

J/L

5/28/98

17



SLOOS = COMP OF

SLOO1 - SLOO4

* AKM REC PHOTOS
OF THESE SAMPLE
LOCs

APPROX SLAG SAMPLE
LOCATIONS FOR SLOO1
THROUGH SLOO5.

1820 COMPLETE AT INIT
SLAG SAMP LOCs, PRO-
CEED TO OFFSITE SLAG
SAMP LOC

9/28/98

CAF

855 INIT SAMPLING

AT S5012. LOC IS ON

NE CORNER OF SLAG

PILE (OFF-SITE)

- PHOTO JK2-9 FACING

SOUTH AT S5012

SAMPLING LOCATION

OFFSITE, ADJACENT TO

MAIN-SLAG-PILE. RUNOFF

1902 INIT SAMP AT

S5013.

PHOTO. JK2-10 FACING

SOUTH

Y/K

9/28/98

S5012 & S5013 ARE

LOC TO WEST OF FACILITY

FENCE / SLAG PILE &

ARE GENERALLY LOCATED

W/IN AREA IMPACTED

BY FACILITY RUNOFF

FROM MAIN SLAG PILE.

SAMP COLLECTED OF

MOIST MAT, NOT SAT

(LIQUID DRAINED OFF)

1938 FIELD TEAM LEAVING

SITE FOR DAY, WILL DISCUSS

NEXT DAYS STRATEGY @

DINNER

SAC

BLANK

CDK

05/29/98

21

07:5 ARRIVE ON SITE FOR
DAYS ACTIVITY,

- MEET WITH PLANT PERPS
& DEV PLAN FOR DAY

0740 PROCEED TO NW
CORNER OF FACILITY.

PERSONNEL:

P. KUEFLER - USEPA

K. HIGGINS - TL

D. UPDIKE - TL

A. MUBIRU - TL

J. KOEHNEN - TL

C. DAVIS - CSD/CHEM

H. YOUNG - CSD/CHEM

7/29/98 GJK

0814 * ZINC OXIDE SAMPLES
FOR (ALL TOTAL METALS)
AND TCLP

0830 PROCEED TO ZINC
OXIDE BUNKER FOR SAMP
JK & KH WILL COLLECT
SAMPLES WEARING RESP.
DUE TO DANGER W/ ZINC
OXIDE. LOCATIONS ARE
APPROX 10' W/IN MAIN
ZO BUNKER AREA. NOT
MUCH FURTHER DUE TO IN-
STABILITY OF AREA.

GJK 5/29/98

0833 PHOTOS

JK 2-11 FACING S
AT ZINC OXIDE

JK 2-12 SE AT
ZINC OXIDE

JK 2-13 W AT
ZINC OXIDE

855 KH 2-14 S @
ZO-003

KH 2-15 S @
ZO-002

KH 2-16 S @
ZO-001

5/29/98 Q/K

0915 COMPLETED SAMP
AT 20 BUNKER. RETURN
TO STAGING AREA. DU/AM
HAD SAND-BAGHOUSE &
HAVE RET TO STAGING
AREA

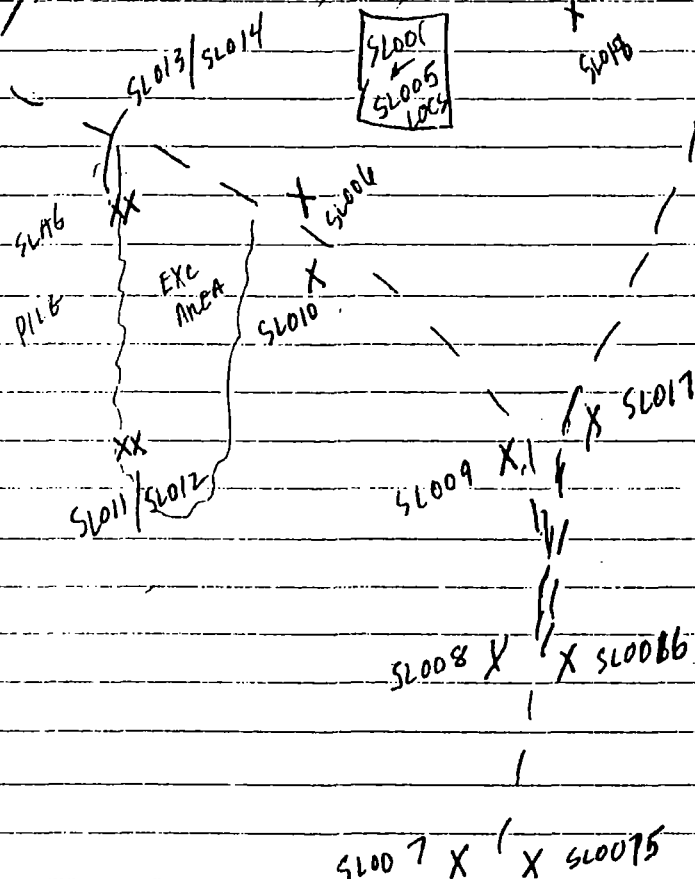
0915 ARRIVE AT UPPER
SLAG PILE AREA. PREP
TO SAMPLE AT MULT
LOCS.

WILL STAKE OUT SAMP
LOC ALONG ROAD &
COLLECT

Q/K

5/29/98

+ SL019 + SL020 25
+ SL018



* APPROX SLAG SAMPLING LOCATIONS

5/29/98

JK

1046

INITIATE SAMP AT

SLOOT. MAT IS W/IN

SLAG PILE

- PHOTO JK2-17 OF

SAMP LOC SLOOT

SAMP COLLECTED USING

SPOON AND INTO JAR

DIRECT FILL, NO COMP DUE

TO LARGE GRAIN SIZE

1057 INIT SAMPLING

OF SLOOT

PHOTO JK2-18

OF SLOOT LOC.

JK

5/29/98

* SAMP PROTOCOL/PROC.

IF MAT IS SMALL TO MED

GRAIN THEN SAMP COLL FROM

3 LOC W/IN SAMPLE AREA

INTO BOWL & HOMOG. IF

LARGE SIZE, SAMP COLLECTED

FROM 3 AREAS INTO CONT.

1106 INIT SAMPLING

AT SLOOT.

PHOTO JK2-19

FACING W AT SAMP

LOC WITHIN EXL AREA.

5/29/98

CHK

1115 INIT SAMPLING

AT SLO/6. LOC ADJ
TO ROAD

PHOTO JK2-20

FACING EAST AT SAMP
LOC, MAT IS FINES TO
SMALL COBBLES. SAMP
DIRECTLY INTO CONT
FROM 3 LOC'S.

* NOTE. DUE TO ^{LARGE} SIZE OF
SOME SLAG. SAMPLE IS
COLLECTED INTO ZIPLOC
AS MAT WILL NOT GO
INTO CONT.

5/29/98

29

CHK

1123 SLO/7. INIT

SAMPLING DUE TO

NATURE OF MATERIAL

SAMPLES COLLECTED INTO

ZIPLOC'S. * DEV FROM PROT. *

PHOTO JK2-21 OF

SLO/7 SAMP LOC. FACING

SW. SAMP LOC IS W/IN

GROUPING OF 3 LOC'S

1140 INIT SAMP AT

SLO/8. SAMP MED

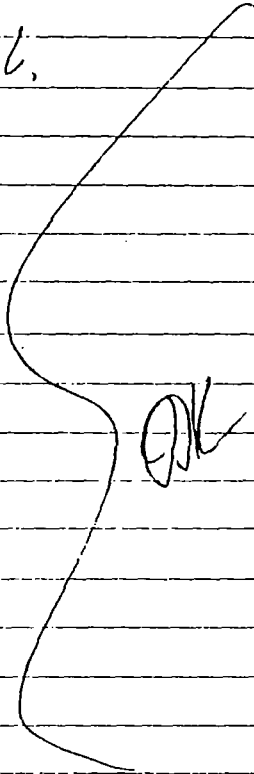
GRAIN. COLLECTED INTO

BROWN & HOMOG.

5/29/98

Y/K

1148 INIT SAMPLING
AT SLO19, SAMP
COLL & HOMOG W/IN
SS BOWL.



OK

Y/K

5/29/98

1150

INIT SAMP AT

SLO20, W/IN GROUP OF
2 LOCs

1153 PHOTO JK2-22

PHOTO FACING WEST

AT LOC SLO18-SLO20

SAMPLE LOCATIONS ARE

AT TOP OF MAIN SCAG

PILE IN AREA W/NOTED

VARIABILITY OF SLAG-TYPES/

SIZES. LOCATIONS ARE

APPROX 15' APART

Q

5/29/98

JK

PROCEED TO LOWER SLAG-
PILE LOC, ALONG ROAD
& ON WALL OF SLAG PILE
W/IN EXC AREA.

1208 INIT SAMPLING AT
SLOOG. LOC IS W/IN
ROADBED TO RIGHT
- SAMP COLL W/ AUGER
INTO SG & INTO CONTAINER

PHOTO JKZ-23 FACING
EAST AT SAMP LOC
SLOOG

JK

5/29/98

33

1213 INIT SAMPLING
OF SLO14. MAT IS
LOWER HALF OF LT GRAY
DARK GRAY SLAG FINES
HORIZON, MAT IS MOSTLY
FINES.

PHOTO JKZ-24 FACING
WEST AT SLAG SAMP
LOCATIONS SLO13/SLO14
(O13 UPPER/O14 LOWER)

5/29/98 JH

1214 INIT SAMP OF SLO13

UPPER STRATA. MAT IS

DARK GRAY FINES. & NOTED

DIFF COLOR FROM LOWER

1217 PHOTO JK2-25

FACING S AT SLAG PILE

& EXC AREA. SLAG PILE

HAS NOTABLE VARIAB

IN STRATA / SLAG w/

COLOR & SOME TEXTURE

VARIATIONS

JH 5/29/98

1225 INIT SAMPLING

AT SLO12. SAMPLE

MAT & MED GRAINSIZE

SLAG WHICH WILL BE

COLLECTED INTO ZIPLOC

BAG DUE TO MAT SIZE.

BAG IS MARKED/LAB

& PLACE w/IN SECOND

BAG & COOLER

1230 INIT SAMPLING AT

SLO11. SAMPLE/DUP

& MS/MSD COLLECTED

5/29/98

OK

COMPLETE AT SLOTT #012

MOVE TO NEXT LOC

SLOO9.

1242 INIT SAMPLING

AT SLOO9. LOC IS

ALONG ROADSIDE AND

COLLECTED ALONG FACE

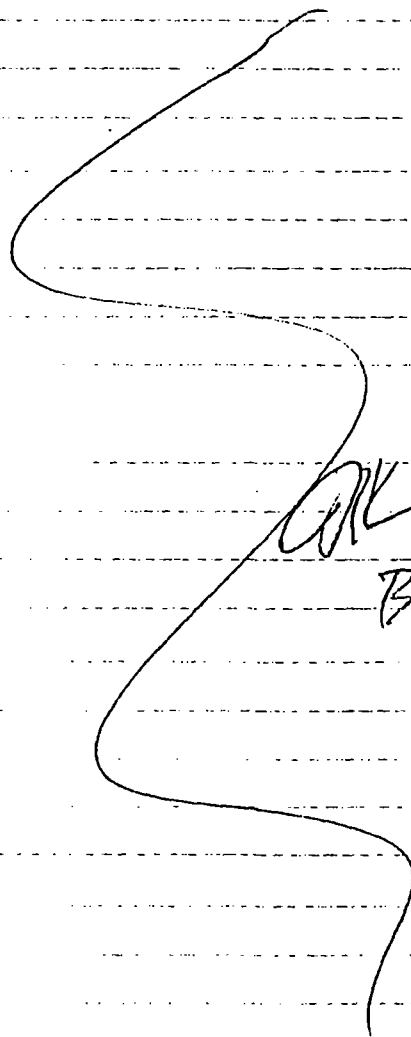
OF LAG PILE AFTER

EXC OF OUTER MATERIAL

OK

5/29/98

37



OK

BLANK

5/29/98

OK

1307 LEAVE SLAG PILE AREA

SITE FOR LUNCH BREAK

WILL RETURN @ 1400P

& PROC TO STAGING
AREA

1347 RETURN TO SITE FROM

LUNCH. PROCEED TO OFFICE

TO PICK UP HEATHER/CNAN

1404 RETURN TO DECON/

STAGING AREA. WILL

PREP FOR BRICK & POT

WATER COOLED SLAG

SAMP. WHICH IS LOC

ALONG 20 BARRIER.

5/29/98

OK

1420 PROC TO BRICK AREA

AREA CONSISTED OF MOD
PILES OF SLAG/SOIL/BRICKUNIT IS APPROX 20' WIDE
BY 100' LONG AND ~10' +
HIGH.

1440 PHOTO JK 2-26

FACING N AT SAMPLE

MAT FOR RB003 MAT

IS QUARTERED + BRICK

SPLIT W/ CHEMICO AND

CONTAINED W/IN ZIPLOC'S

SPLITTING ACCOMP W/

HAMMER & CHISEL

5/29/98

WJ

445 INIT SAMP OF
RBOO4. - SAMPLE IS
REF BRICK, SPLIT INTO
MULTIPLE PIECES &
PORTIONED INTO SAMP
CONT (21 PLOC)

1455 INIT SAMP AT
RBOO5. MAT IS RB
SPLIT INTO SMALLER
PIECES & COLLECTED
INTO ZIPLOC BAGS
FOR ANALYSIS. PIECES
OF MOD/LARGE SIZE.

5/29/98

41

1505 SAMP COLLECTION
OF SCRAP MATERIALS
WITHIN REFRACTORY
BRICK PILE

1520 RET TO RECON/
DECON AREA. WILL GO
TO DECON PAD TO DIS
POSE OF FDW & PPE
W/HERITAGE. HERITAGE
ALREADY AWAITING TL
TO PICKUP BARRELS OF
DECON WATER & PPE

5/29/98 QK

1540 AT DECON AREA
 PREPARING DRUMS FOR
 RELINQ TO HERITAGE-
 DRUMS SEALED, LABELLED
 & MANIF TO HERITAGE
 BY PK

1557 HERITAGE PICKUP
 COMPLETED. NAW

1600 JK TAKING PK
 BACK TO MAIN OFFICE
 AREA. TL TO REMAIN
 ON SITE TO COLLECT
 BACKGROUND SAMPLE

QK 5/29/98

1605 ARRIVE AT CHEMETCO
 RANCH HOUSE, LOC IN
 FAR EASTERN AREA OF
 SITE. WILL COLLECT
 2 PKGD SAMPS OF SOIL
 FROM AREA.

1609 INIT SAMPLING AT
 BK 002. GAMP MAT IS
 MED CLAY. BROWN

↑ X BK007

2150'

↓ X BK002

FACILITY

RANCH
HOUSE

5/29/98 OK

1610 PHOTO JK2-26

FACING SSE AT

BACKGROUND SAMPLE

LOCATION 2 (BK002)

LOC. IS APPROX 50'
NORTH OF RANCH HOUSE

DRIVEWAY. LOC WAS
COVERED W/ GRASS.

HAND AUGER USED TO
COLLECT SAMP FROM

SOIL SURF TO ~6' BGS
(0"-6" BGS)

5/29/98 OK

1620 PHOTO JK2-27

FACING SOUTH AT

SAMPLE LOCATION FOR

BK-003. THIS LOC. IS

APPROX 150' EAST OF
BK-002.

1625 SAMPLE COLLECTED

TEAM RET TO MAIN

OFFICE AREA. COMPLETE

FOR DAY

1650 TL LEAVING SITE

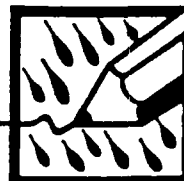
FOR PM/ACT

5/29/98

OK

OK
BLANK

"Rite in the Rain"®



ALL-WEATHER
**SPIRAL
FIELD NOTEBOOK**

No. 185

<i>Chemetro Sampling Event</i>
<i>TechLaw, Inc.</i>
<i>May 28th - 29th, 1998</i>
<i>Hartford, IL</i>
<i>(Kevin Higgins)</i>

8 1/2" x 11"



5/28/98

Chemetco Sampling

- 0725 - Arrived @ facility and met w/ Heather Young; waited for Cindy Davis, Chris C. (IEPA); Chris did not arrive
- 0730 - Cindy Davis } CSD Environmental Services
Heather Young }
Patrick Kuefler - USEPA, Region 5
John Koehnen }
Kevin Higgins } TechLaw, Inc.
Anthony Mubiru } Personnel
~~Kevin Higgins~~
Doug Updike }
- 0730 - Pat outlines basic sampling agenda for 2-day event
- Facility requests splits on SW/sed., brick, slag samples taken by TechLaw
- Facility will not split Zinc Oxide
- 0745 - Left for general "recon" of southside of facility
- 0800 - "Recon" of SW/sed. areas; Dropped off IDW drums @ area known as "Decon Pad"; checked-on maintenance building area where decon. area ^{area} water (potable) water can be obtained
- Flagged SW/sed. and "Toe" soil samples
- 0915 - Flagged SW/sed. samples to the west of Containment #3; Flagged Background Soil sample;
- 10:20 - Took SW/sed. - 1 samples; MS/MSD and ED (for SW/sed. - ~~10:20 RA~~ 10:40 - Took SW/sed. - ~~2~~ ~~SKAT~~ - 1 EQ-Blank material - bagged for ED (later)
- 11:10 - SW/sed. - 2 Location Sampling
- 11:30 - Bkg - 1 (BK-1) Sample Collection; soil is mostly clay w/ small amount of organic matter on top (\approx 2 inches); packed sampling equipment
- 12:00 - Re-packed equipment and checked samples
- 12:25 - Took SW/SD - 3 samples; SD sample more clayey than SD-1 and SD-2
- 12:35 - Lunch
- 13:30 - Returned to Site; set-up Van and "decon" area
- 13:50 - Decon. bowls, augers, spoons @ decon area in parking lot
- 14:30 - Equipment Blank SS-301 on bowls, augers, spoons; decon consists ofalconox/liquinox wash w/DI rinse

1/1/99 gis

5/28/98

Chemetro Sampling

2.

- 16:10 - Took Equipment Blank SD-306 on auger, spoon, bowl used in sampling SD-006
- 16:15 - Empty "decon" water in drum (from sampling SD-1 thru. SD-63) and from SS-1 thru. SS-8
- 16:30 - Main site recon. and RA of SW/SD-B location
- 17:10 - Collection of SW-007; "in situ" field measures as follows:
pH = 10.34; Cond. = 29.5 $\mu\text{S}/\text{cm}$; Turb. = 36.0 NTU;
Temp. = 33.6 °C; DO = 2.3 mg/L
- 17:10 - Camera 3, P-1: Looking East: Location of SW/SD-007
- 17:11 - " " P-2: " SW: Stormwater ponds
- 17:11 - " " P-3: " SE: " "
- 17:30 - Recon. of SW/SD and SS samples to the East of the Main site facility [w/ Chris (IEPA) and Cindy Davis]
- 18:25 - Sampled SS-009 Location \approx 30' East of MW-26 and \approx 250' North of SE corner of Facility fence line
- 18:30 - Sampled SS-010 \approx 80' North of SS-009
- 18:40 - " SS-011
- 18:55 - SW-008, pH = Sample collection; Horiba field measures as follows: 11.17; Cond. = 20.8; Turb = 181; Temp. = 20.0 °C
- 18:55 - SS-012 Sample Collection
- 19:02 - SS-013 Sample Collection
- 19:35 - Left Site

5/29/98

- 7:35 - Arrived @ Site and met w/ Cindy and Heather (ESD)
- 8:00 - Decon @ NW corner of Main Site

5/28/98

Chemical Sampling

3.

8:40 - ZnOx. sampling; Bunker Storage Area

8:45 - 20-003

8:50 - 20-002

8:50 - 20-001

9:00 - Pack-Up

All samples Taken in Bunker; 20-001 Composite Homogenized (FD and MS/MSD)

and return to decon area @ NW corner of Main Site

- Pat. K requested Total Metals/TCLP on Bunker samples

9:20 - Sample Labeling BD and 20-004 (Filter Press)

0953 - CAMERA #3 - DIRECTION: NE - BUCKET OF ZnO₂ RETRIEVED - SAMPLE WAS COLLECTED FROM THIS BUCKET
↑
FILTER CAKE PRESS

0955 - SAMPLE 20-004 COLLECTED. 1X80Z AMBER JAR FOR TCLP METALS & TOTAL PCP METALS

0955 - Camera 3 ^{KOH} 20-004 Sample Location @ Southside (SW-Side) of DIS Building (Facing North)

Camera 3 - No. 2 Baghouse (aka Roof Baghouse) (N-NW)

1015 - COLLECT BD-002 SAMPLE FROM BAGHOUSE #2.

1X80Z AMBER JAR FOR TCLP METALS.

Sampled out of Second Apartment from South End; 2 photos of BD-002 sample location

1025 - No. 1 Baghouse (Genies AAF - American Air Filter) - Sample BD-001 w/FD and MS/MSD - Location is East of Main Foundry Building; Photo - SE - BD-001 sample location

1030 - Photo (South) of Facility Area west of Slag Granulation Baghouse

1045 - COLLECT BD-003 SAMPLE FOR TCLP METALS 1X80Z AMBER JAR. COLLECTED FROM PRIMARY BAGHOUSE SLAG GRANULATION PLANT. CAMERA #3 PHOTO OF COLLECTION/DUST COLLECTION BIN AND INSIDE OF BIN - N/N Direction.

1055 - COLLECT SAMPLE BD-004 FOR TCLP METALS 1X80Z AMBER JAR FROM SECONDARY BAGHOUSE @ SLAG GRANULATION PLANT

5/28/98

Chemtrac Sampling

4.

- 11:00 - BD-004 Sample Location Photo (SW)
- 11:20 - Went back to decon area; re-grouped samples and sampling gear
- 11:40 - Sampling slag @ NE corner of Unit 5
 - CSD not using ice when splitting samples - simply putting samples in bucket
- 12:00 - sampling slag; John K. Taking notes
- 13:00 - Left site for lunch
- 14:00 - RB Sampling - J.K. taking notes
- 16:20 - BK Sampling
- 16:45 - Left site

APPENDIX D

CHAIN-OF-CUSTODY FORMS

FIELD SAMPLING AND ANALYSIS REPORT

**CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809**

Project Code		Samples Shipped To		Samplers Names		1) Sample description (Enter in column A)		2) Preservatives (Enter in column B)	
Project (site) Name		Carrier		Samplers Signatures		1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)		1. HCl 2. HNO ₃ 3. NaHSO ₄ 4. H ₂ SO ₄ 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved	
City, State, Zip Code		Air Bill Number							
ROS-020		QST Environmental 4104 SW 104th Terrace Hubert, FL 32669		Doug Urdike Kevin Higgins					
C1H1		FEDEX		Kevin Higgins					
Date Shipped 6/1/98		Air Bill Number 805774443276							
Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis		Remarks/ Tag Numbers	
						TCLP	M-M		
RB-001	7	7	G	1	5/29/98, 14:30	✓	TBCKS1	msnsd *1	5-176917
RB-002	7	7	G	1	5/29/98, 14:35	✓	TBCKS2	*2	5-176918
RB-003	7	7	G	1	5/29/98, 14:40	✓		*3	5-176919
RB-004	7	7	G	1	5/29/98, 14:45	✓		*4	5-176920
RB-005	7	7	G	1	5/29/98, 14:50	✓		*5	5-176921
RB-006	7	7	G	1	5/29/98, 15:05	✓		*6	5-176922
KRM 6/1/98									
<div> <div>Re. Inquished By</div> <div>Time</div> <div>Date</div> <div>Received By</div> <div>Time</div> <div>Date</div> <div>Received By</div> <div>Time</div> <div>Date</div> <div>Received By</div> <div>Time</div> <div>Date</div> </div> <div> <div>Re. Inquished By</div> <div>Time</div> <div>Date</div> <div>Received By</div> <div>Time</div> <div>Date</div> <div>Received By</div> <div>Time</div> <div>Date</div> <div>Received By</div> <div>Time</div> <div>Date</div> </div>									
<div> <div>Remarks</div> <div>Split Samples — Accepted — Declined (Signature)</div> </div>									
<div> <div>Distribution: Original — A.T. Kearney, Inc.</div> <div>Carbon copies — Laboratory, work assignment manager, client (as appropriate)</div> </div>									

SK 6/3/78 18:30

TechLaw 6/1/98
 KRH
A.T. KEARNEY
 A.T. Kearney Inc.
 222 West Adams
 Chicago, IL 60606
 312/648-0111

Chain of Custody Record

11109

Project Code R05-020		Samples Shipped To QST Environmental 404 SW. 104th Terrace Newberry, FL 32669		Samplers Names Kevin Higgins Doug Updike		1) Sample description (Enter in column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)		2) Preservatives (Enter in column B) 1. HCl 2. HNO ₃ 3. Na HSO ₄ 4. H ₂ SO ₄ 5. Na OH 6. Other (specify) 7. Ice only N. Not preserved	
Project (site) Name CIH1		Carrier FEDEX		Samplers Signatures Kevin Higgins					
City, State, Zip Code		Air Bill Number 805974443276							
Date Shipped 6/1/98									

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis										Remarks/ Tag Numbers	
						RCRA Metals	TECP Metals	TBRKSI									
SL-003	7	7	G	1	5/28/98, 17:30	✓	TBRKSI2									*7	5-176895
SL-004	7	7	G	1	5/28/98, 17:45	✓										*8	5-176896
SL-005	7	7	G	1	5/28/98, 17:45	✓										*9	5-176898
SL-006	7	7	G	1	5/29/98, 12:03	✓										*10	5-176899
SL-007	7	7	G	1	5/29/98, 10:46	✓										*11	5-176897
SL-008	7	7	G	1	5/29/98, 11:06	✓										*12	5-176900
SL-009	7	7	G	1	5/29/98, 12:42	✓										*13	5-176901
SL-010	7	7	G	1	5/29/98, 12:43	✓										*14	5-176902
SL-011	7	7	G	3	5/29/98, 12:30	✓										*15	MS/MO: 5-176905 5-176904, 5-176903
SL-111	7	7	G	1	5/29/98, 12:30	✓										*16	5-176906
KRH 6/1/98																	

Relinquished By Kevin Higgins		Time 13:15	Date 6/1/98	Received By QST		Time 12:00	Date 6-2-98	Received By		Time	Date	Received By		Time	Date
Relinquished By		Time	Date	Received By		Time	Date	Received By		Time	Date	Received By		Time	Date

Remarks: **Cooler Temp = 4°C**

Split Samples — Accepted — Declined (Signature)

Distribution: Original — A.T. Kearney, Inc.
 Carbon copies — Laboratory, work assignment manager, client (as appropriate)

1/12 6/3/98 18:55

Page 3 of 3

T. Chlaw 6/1/98
A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11099

Project Code R05-020		Samples Shipped To QST Environmental 404 SW 104th Terrace Newberry, FL 32669		Samplers Names Kevin Higgins		1) Sample description (Enter in column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify) 2) Preservatives (Enter in column B) 1. HCl 2. HNO ₃ 3. NaHSO ₄ 4. H ₂ SO ₄ 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved	
Project (site) Name C1H1		Carrier FEDEX		Samplers Signatures Kevin Higgins			
City, State, Zip Code		Air Bill Number 005974443276					
Date Shipped 6/1/98							

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis										Remarks/Tag Numbers
						RCRA Metals	TCLP Metals									
20-001 <i>MSD</i>	7	7	G	3	5/29/98, 09:50	✓	✓	SL = TBCKS1.2								<i>MS/MSD: 5-176963 5-176961, 5-176962</i>
20-101	7	7	G	1	5/29/98, 09:50	✓	✓									5-176964
20-002	7	7	G	1	5/29/98, 09:50	✓	✓									5-176965
20-003	7	7	G	1	5/29/98, 9:45	✓	✓									5-176966
20-004	7	7	G	1	5/29/98, 7:55	✓	✓									5-176967
20-005	7	7	G	1	5/29/98	✓	✓									5-176968 <i>KRH</i>
SD-001 <i>MSD</i>	5	7	G	3	5/28/98, 10:40	✓		TBCKS1.2								<i>MS/MSD: 5-176969 5-176970, 5-176971</i>
SD-101	5	7	G	1	5/28/98, 10:40	✓										5-176971
SD-002	5	7	G	1	5/28/98, 11:20	✓										5-176972
SD-003	5	7	G	1	5/28/98, 12:15	✓										5-176973
SD-008	5	7	G	1	5/28/98, 13:55	✓										5-176974
SL-001 <i>MSD</i>	7	7	G	3	5/28/98, 17:07	✓		TBCKS1								<i>MS/MSD: 5-176993 5-176994, 5-176995</i>
SL-101	7	7	G	1	5/28/98, 17:07	✓										5-176992
SL-002	7	7	G	1	5/28/98, 17:19	✓										5-176994

Relinquished By Kevin Higgins	Time 18:00	Date 6/2/98	Received By Jim King QST	Time 1200	Date 6-2-98	Received By	Time	Date	Received By	Time	Date
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks: **Perform RCRA Metals and RCRA TCLP Metals Analyses on all "20" samples**

Distribution: Original — A.T. Kearney, Inc. **Cooler Temp = 4°C**
Carbon copies — Laboratory, work assignment manager, client (as appropriate)

NR 6/3/98 18:40

A.T. Kearney 1/3907/1 TR

TechLaw 6/1/98

ATKEARNEY

KRH

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11104

Project Code R05-020	Samples Shipped To AST Environmental 404 SW 104th Terrace Newberry, FL 32669	Samplers Names Kevin Higgins Doug Updike	1) Sample description (Enter in column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)	2) Preservatives (Enter in column B) 1. HCl 2. HNO ₃ 3. Na HSO ₄ 4. H ₂ SO ₄ 5. Na OH 6. Other (specify) 7. Ice only N. Not preserved
Project (site) Name CIH1	Carrier FEDEX	Samplers Signatures Kevin Higgins		
City, State, Zip Code	Air Bill Number 00597443276			
Date Shipped 6/1/98				

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis	Remarks/Tag Numbers
TBRKS1							
BK-001 X30	5	7	G	1	5/28/98, 11:40	✓	TBRKS1.2 5-176944, KJH
BK-002 31	5	7	G	1	5/29/98, 16:10	✓	5-176945
BK-003 32	5	7	G	1	5/29/98, 16:25	✓	5-176946
SS-009 33	5	7	G	1	5/28/98, 18:25	✓	5-176947
SS-010 34	5	7	G	1	5/28/98, 18:30	✓	5-176948
SS-011 ms/msd 35	5	7	G	2	5/28/98, 18:35	✓	5-176949 ms/msd
SS-012 KRH 111 36	5	7	G	1	5/28/98, 18:35	✓	5-176951
SS-013 37	5	7	G	1	5/28/98, 18:55	✓	5-176952
SS-013 38	5	7	G	1	5/28/98, 17:02	✓	5-176953
BD-001 ms/msd 39	7	7	G	3	5/29/98, 10:25	✓	TBRKS1.2 5-176954, 5-176955, ms/msd
BD-101 40	7	7	G	1	5/29/98, 10:25	✓	5-176957
BD-002 41	7	7	G	1	5/29/98, 10:15	✓	5-176958
BD-003 42	7	7	G	1	5/29/98, 10:45	✓	5-176959
BD-004 43	7	7	G	1	5/29/98, 10:55	✓	5-176960

Relinquished By Kevin Higgins	Time 18:00	Date 6/1/98	Received By Jim Higgins	Time 18:00	Date 6/1/98	Received By Jim Higgins	Time 18:00	Date 6/1/98	Received By Jim Higgins	Time 18:00	Date 6/1/98	Received By Jim Higgins	Time 18:00	Date 6/1/98	Received By Jim Higgins
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By

Remarks Archive all "SS" samples after performing RERA Metals Analysis	Split Samples — Accepted — Declined (Signature)
Distribution: Original — A.T. Kearney, Inc. Cooler Temp = 4°C Carbon copies — Laboratory, work assignment manager, client (as appropriate)	Page 1 of 3

6/3/98 18:45

010010

A.T. Kearney 1/39071/1

Tech Law KRH
6/1/98
A.T. KEARNEY

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11103

Project Code: R05-020	Samples Shipped To: CRST Environmental 404 SW 104th Terrace Newberry, FL 32669	Samplers Names: Kevin Higgins	1) Sample description (Enter in column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)	2) Preservatives (Enter in column B) 1. HCl 2. HNO ₃ 3. NaHSO ₄ 4. H ₂ SO ₄ 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved
Project (site) Name: CIHI	Carrier: FEDEX	Samplers Signatures: [Signature]		
City, State, Zip Code:	Air Bill Number: 305974443276			
Date Shipped: 6/1/98				

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis	Remarks/Tag Numbers
TBRKS1							
SL-012 *430	7	7	G	1	5/29/98, 12:25	✓	TBRKS1 5-176908
SL-013 *453	7	7	G	1	5/29/98, 12:14	✓	TBRKS1 5-176909
SL-014 *463	7	7	G	1	5/29/98, 12:13	✓	5-176910
SL-015 *47	7	7	G	1	5/29/98, 10:57	✓	5-176911
SL-016 *48	7	7	G	1	5/29/98, 11:15	✓	5-176912
SL-017 *49	7	7	G	1	5/29/98, 11:23	✓	5-176913
SL-018 *50	7	7	G	1	5/29/98, 11:48	✓	5-176914
SL-019 *51	7	7	G	1	5/29/98, 11:45	✓	5-176915
SL-020 *52	7	7	G	1	5/29/98, 11:50	✓	5-176916
ms/m SD SW-001 TBRKW1	1	2,7	G	3	5/28/98, 10:20	✓	TBRKW1 5-176924, 5-176925, 5-176926
SW-101 *2	1	2,7	G	1	5/28/98, 10:20	✓	5-176923
SW-002 *3	1	2,7	G	1	5/28/98, 11:15	✓	5-176927
SW-003 *4	1	2,7	G	1	5/28/98, 12:15	✓	5-176931
SW-003 *5	1	2,7	G	1	5/28/98, 13:50	✓	5-176928

Relinquished By: [Signature]	Time: 18:00	Date: 6/1/98	Received By: [Signature]	Time: 18:00	Date: 6-2-98	Received By:	Time:	Date:	Received By:	Time:	Date:
Relinquished By:	Time:	Date:	Received By:	Time:	Date:	Received By:	Time:	Date:	Received By:	Time:	Date:

Remarks: Cooler Temp = 5°C	Split Samples — Accepted — Declined (Signature)
-----------------------------------	---

Distribution: Original — A.T. Kearney, Inc. Carbon copies — Laboratory, work assignment manager, client (as appropriate)	Page <u>1</u> of <u>2</u>
---	---------------------------

al/m 6/3/98 18:50

110011

A.T. Kearney 1/39071 TR

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11112

Project Code R75-020	Samples Shipped To QST Environmental 404 SW 104th Terrace Newberry, FL 32669	Sampler Names DOUGLAS J. UPDIKE JOHN KOEHNEN Kevin Higgins	1) Sample description (Enter in column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Rinse 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)	2) Preservatives (Enter in column B) 1. HCl 2. HNO ₃ 3. NaHSO ₄ 4. H ₂ SO ₄ 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved
Project (site) Name CIAI				
City, State, Zip Code	Carrier FEDEX	Sampler Signatures <i>[Signature]</i> <i>[Signature]</i> <i>[Signature]</i>		
Date Shipped 6/1/98	Air Bill Number 805174443276			

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis											Remarks/ Tag Numbers
SW-006 TBRKW1A6	1	2	G	1	5-28-98/1530	X	TBRKW1									*5-176939	
SD-006 TBRKS1A53	5	7	G	1	5-28-98/1540	X	TBRKS1.2									#5-176940	
SD-306 TBRKW1A7	4	2	G	1	5-28-98/1605	X	TBRKW1									*5-176941	
SW-007 TBRKW1A8	1	2	G	1	5-28-98/1710	X	TBRKW1									*5-176943	
SD-007 TBRKS1A54	5	7	G	1	5-28-98/1720	X	TBRKS1.2									*5-176942	
KRII 6/1/98																	

Relinquished By <i>Ken R. Haggard</i>	Time <i>8:00</i>	Date <i>4/6</i>	Received By <i>James King</i>	Time <i>2:00</i>	Date <i>6-2-78</i>	Received By	Time	Date	Received By	Time	Date
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks	Split Samples — Accepted — Declined (Signature)
Cook Temp = 32	

Dissemination: Original — A.T. Kearney, Inc.

Carbon copies — Laboratory, work assignment manager, client (as appropriate)

Page 2 of 2

11/2 6/3/99 18.55

A.T. Kearney 1/3907/1 TR

00012

Trichloro
AT Kearney

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

111.06

Project Code RDS-020	Samples Shipped To QST Environmental 404 SW 164th Terrace Newberry, FL 32669	Samplers Names Kevin Higgins	1) Sample description (Enter in column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)	2) Preservatives (Enter in column B) 1. HCl 2. HNO ₃ 3. NaHSO ₄ 4. H ₂ SO ₄ 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved
Project (site) Name C1H1	Carrier FEDEX	Samplers Signatures <i>Kevin Higgins</i>		
City, State, Zip Code	Air Bill Number 8059744			
Date Shipped 6/1/98				

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis <i>PLCA Metals TECP Metals</i>	Remarks/ Tag Numbers
SL-301 TBRKWIX9	4	2,7	G	1	5/29/98, 15:10	✓	TBRKWIX 5-176930
SL-311 *10	4	2,7	G	1	5/29/98, 15:10	✓	5-176907
SL-301 *11	4	2,7	G	1	5/29/98, 14:35	✓	5-176929
<i>KRH 6/1/98</i>							

Relinquished By <i>Kevin Higgins</i>	Time 18:00	Date 6/1/98	Received By <i>John D. [Signature]</i>	Time 12:00	Date 6-2-98	Received By	Time	Date	Received By	Time	Date
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks	Split Samples — Accepted — Declined (Signature)
---------	---

A.T. Kearney 1/3907/1 TR

00013

N/A 6/3/98 18:55

TECH LAW
AT Kearney Inc.

A.T. Kearney Inc.
222 West Adams
Chicago, IL 60606
312/648-0111

Chain of Custody Record

11111

Project Code RD5-020	Samples Shipped To QST Environmental 404 SW 104th Terrace Newberry, FL 32664	Samplers Names DOUGLAS J. UDDIKE JOHN KOEHNEN KEVIN HIGGINS	1) Sample description (Enter in column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil/Sediment 6. Oil 7. Waste 8. Other (specify)	2) Preservatives (Enter in column B) 1. HCl 2. HNO ₃ 3. NaHSO ₄ 4. H ₂ SO ₄ 5. NaOH 6. Other (specify) 7. Ice only N. Not preserved
Project (site) Name CIHI	Carrier FEDEX	Sampler's Signatures <i>[Signatures]</i>		
City, State, Zip Code	Air Bill Number 809974443276			
Date Shipped 6/1/98				

Sample Identification Numbers	A. Matrix enter from Box 1	B. Preser. enter from Box 2	Grab or Comp	Number of Sample Containers	MM/DD/YY Time sample collection	Analysis	Remarks/Tag Numbers
SS-001 TBRKS1X5	5	7	G	3	5-28-98/1002	X	SL- TBRKS1Z
SS-101 56	5	7	G	1	5-28-98/1002	X	*5-176993
SS-002 57	5	7	G	1	5-28-98/1025	X	*5-176994
SS-003 58	5	7	G	1	5-28-98/1037	X	*5-176997
SS-004 59	5	7	G	1	5-28-98/1102	X	*5-176998
SS-005 60	5	7	G	1	5-28-98/1117	X	*5-176996
SS-006 61	5	7	G	1	5-28-98/1129	X	*5-176995
SS-007 62	5	7	G	1	5-28-98/1138	X	*5-176932
SS-008 63	5	7	G	1	5-28-98/1148	X	*5-176933
SW-004 TBRKW1X12	1	2	G	1	5-28-98/1400	X	TBRKW1
SD-004 TBRKS1X64	5	7	G	1	5-28-98/1410	X	TBRKS1.2
SW-005 TBRKW1X13	1	2	G	1	5-28-98/1440	X	TBRKW1
SD-005 TBRKS1X65	5	7	G	1	5-28-98/1450	X	TBRKS1.2
SS-311 TBRKW1X14	4	2	G	1	5-29-98/10825	X	TBRKW1

Relinquished By <i>[Signature]</i>	Time 13:00	Date 6/1/98	Received By <i>[Signature]</i>	Time 12:00	Date 6-2-98	Received By	Time	Date	Received By	Time	Date
Relinquished By	Time	Date	Received By	Time	Date	Received By	Time	Date	Received By	Time	Date

Remarks Archive all "SS" samples after performing EPA Metals Analysis	Split Samples — Accepted — Declined (Signature)
--	---

Distribution: Original — A.T. Kearney, Inc. <i>Cooler Temp = 5°C</i>	Page <u>1</u> of <u>2</u>
--	---------------------------

A.T. Kearney 1/3907/1 TR

00014

NA 6/3/98 19:00

QST COOLER RECEIPT FORM

Page 1 of 2

THIS FORM IS TO BE EXECUTED BY THE QST SAMPLE RECEIPT CUSTODIAN WHEN PROCESSING SHIPPING CONTAINERS.
 ANY *No IS TO BE DESCRIBED IN *DETAILS/COMMENTS. IMMEDIATE DOCUMENTATION OF PROBLEMS TO THE ANALYTICAL
 PROJECT MANAGER WILL FACILITATE COMMUNICATION WITH THE CLIENT TO RESOLVE ANY PROBLEMS.
 REFER TO ACTUAL CHAIN-OF-CUSTODY AND AIRBILL (IF APPLICABLE) FOR ADDITIONAL SAMPLE DOCUMENTATION.

Project: Tech Land Shipping Container # (QST) / Other: 2089
 Received (mm/dd/yr/hr): 6-2-98 1200 By: [Signature]
 Opened (if different): _____ By: _____

Preliminary Examination Checklist

Did the shipping container arrive with an airbill/shipping slip? (No) Yes
 If applicable, carrier name & airbill #: Airbills were removed - FedEx

Were custody seals on the outside of the container? *No (Yes)
 If Yes, a: were custody seals intact upon arrival? *No (Yes)
 b: enter Seal Date and Name (or enter "NA" if not available): 6-1-98 RRH

When the container was scanned for radioactivity, were readings within criteria? ... *No (Yes)
 Was Chain of Custody (COC) documentation provided with the shipment? *No (Yes)
 If Yes, a: was COC fully executed by the shipper (in ink)? *No (Yes)
 b: did you sign the COC in the appropriate field? *No (Yes)
 c: was the project identifiable from the COC? *No (Yes)
 If No, how was this determined? _____

Were samples received within criteria of 2-6° C? *No (Yes)

Sample Examination & Check-In ChecklistSample Temperature 5 °C

Were samples packaged in conformance to generally accepted practices? *No (Yes)
 Did all sample containers arrive intact and sealed? *No (Yes)
 Did all sample containers have secure and completed labels? *No (Yes)
 If sample containers possessed tags, circle: Tags only (Tags + Labels)
 Were individual bottles/vials sealed with custody tape or seals? (No) Yes
 Did all labels and/or tags agree with COC? *No (Yes)
 Did volumes, containers, & preservations seem appropriate to indicated tests? *No (Yes)

Did pH checks of all preserved water samples confirm indicated preservations? *No (Yes) N/A
 (If not document sample ID, fraction and pH below)
 Were any containers for cyanide analysis (B fractions) not basified (pH > 7)? *No Yes (N/A)
 If Yes, did they pass the lead acetate test indicating no sulfides present *No Yes (N/A)
 Were VOA vials (waters) free from bubbles? *No Yes (N/A)

Was this checklist free from deficiencies requiring notification of the Lab Project Manager?
 If No, note who was contacted & when in Details/Comments below) *No (Yes)

Was a Multiple Cooler Supplement form used for this shipment? No (Yes)

*Details/Comments:(note sample numbers) _____

QST COOLER RECEIPT FORM

Page 2 of 2

Multiple-Cooler Supplement

Project Name: TechlawDate Received: 6-2-98

THIS FORM IS TO BE EXECUTED BY THE QST SAMPLE RECEIPT CUSTODIAN WHEN PROCESSING MULTIPLE COOLERS (TWO-TEN) FOR THE SAME SET OF SHIPPING CONTAINERS FOR A GIVEN PROJECT.. IT IS DESIGNED TO DOCUMENT THE IDENTITY OF EACH COOLER IN THE SHIPMENT, AND MUST ACCOMPANY THE STANDARD QST COOLER RECEIPT FORM (CRF) AND BE CLEARLY REFERENCED ON THE CRF.

EACH COOLER INCLUDED IN THIS RECEIPT IS TO BE DOCUMENTED BELOW. ANY *NO NOTED ON THE CRF IS TO BE DESCRIBED IN DETAILS/COMMENTS AND IS TO BE REFERENCED TO THE CRF COOLER # NOTED BELOW.

CRF Cooler #	Shipping Container #	Temp (°C)	pH Checked
1.	<u>2089</u>	<u>4</u>	N Y <u>(N/A)</u>
2.	<u>1266</u>	<u>5</u>	N Y <u>(N/A)</u>
3.	<u>1483</u>	<u>3</u>	N <u>(Y)</u> N/A
4.	<u>NA</u>	<u>4</u>	N <u>(Y)</u> N/A
5.			N Y N/A
6.			N Y N/A
8.			N Y N/A
9.			N Y N/A
10.			N Y N/A

Details/Comments: (note cooler and sample numbers) _____

DATE: 6-2-98CRFS#: 2089

f:\admin\common\forms\1213\crf9.97

00016

APPENDIX E
INVESTIGATIVE-DERIVED WASTE MANIFESTS
FIELD SAMPLING AND ANALYSIS REPORT

CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809



PLEASE PRINT OR TYPE (Form assigned for use on elite (12-pitch typewriter.) Form approved. OMB No. 2050-0039. Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA No. ICP 2000000130		Manifest Document No. 050001		2. Page 1 of 1		Information in the shaded areas is not required by Federal law, but items D, F, H, I and K are required by State law.					
3. Generator's Name and Mailing Address USEPA REGION V ATTN: K. HIGGINS 77 WEST JACKSON BLVD, CHICAGO, IL 60605-3590 712 323-6267 x1						A. State Manifest Document Number INA1111612							
4. Generator's Phone (800) 635-4000						B. State Generator's ID ID#1198015008							
5. Transporter 1 Company Name HERITAGE TRANSPORT						C. State Transporter's ID IL ID#1554							
6. US EPA ID Number I.K.D.0.5.8.4.8.4.1.1.4						D. Transporter's Phone (317) 381-6848							
7. Transporter 2 Company Name						E. State Transporter's ID							
8. US EPA ID Number						F. Transporter's Phone							
9. Designated Facility Name and Site Address HERITAGE ENVIRONMENTAL SERVICES 7901 W. MORRIS ST. INDIANAPOLIS IN 46231						10. US EPA ID Number I.N.D.0.9.3.2.1.9.0.1.2							
G. State Facility's ID RRIN03						H. Facility's Phone (317) 486-2898							
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol.		15. Waste No.	
HAZARDOUS WASTE, SOLID, N.O.S., 9, NA3077, PGIII (D004,D005,D006,D007,D008,D010,D011) ERG# 171						No. Type							
						0 0 1 D M		XX X 20		P		D004	
HAZARDOUS WASTE, LIQUID, N.O.S., 9, NA3082, PGIII (D004,D005,D006,D007,D008,D010,D011) ERG# 171						0 0 1 D M		X X X 30		G		D004	
Additional Descriptions for Materials Listed Above						K. Handling Codes for Wastes Listed Above							
A) 46002-2; D005, D006, D007, D008, D010, D011						A) S01 B) T21							
B) 46002-1; D005, D006, D007, D008, D010, D011													
16. Special Handling Instructions and Additional Information													
VEHICLE LICENSE# I N D L 2974 SITE ADDRESS: 3576 CHEMETCO LANE 24 HR EMERGENCY# 314-388-3500 HARTFORD, IL 62048													
17. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.													
Printed/Typed Name Patrick Kuefner						Signature <i>Patrick Kuefner</i>						Date Month 05 Day 27 Year 93	
18. Transporter 1 Acknowledgement of Receipt of Materials						Signature <i>Sean Redington</i>						Date Month 05 Day 27 Year 93	
19. Transporter 2 Acknowledgement of Receipt of Materials						Signature <i>Michael Swartz</i>						Date Month 05 Day 27 Year 93	
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted item 19.													
Printed/Typed Name MICHAEL SWARTZ						Signature <i>Michael Swartz</i>						Date Month 05 Day 27 Year 93	

National Response Center at 800/424-8802 or 202/426-2675

INA1111612



PLEASE PRINT OR TYPE

(Form designed for use on elite (12-pitch typewriter.)

Form approved. OMB No. 2050-0039. Expires 9-30-94

GENERATOR

TRANSPORTER

FACILITY

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. **1.E.P.00000130** Manifest Document No. **000001**

2. Page 1 of 1 Information in the shaded areas is not required by Federal law, but items D, F, H, I and K are required by State law.

3. Generator's Name and Mailing Address
USEPA REGION V ATTN: K. HIGGINS
77 WEST JACKSON BLVD, CHICAGO, IL 60605-3590

A. State Manifest Document Number
INA1111612

4. Generator's Phone **(312) 361-6646**
5. Transporter 1 Company Name **HERITAGE TRANSPORT** 6. US EPA ID Number **I.N.D.0.5.8.4.8.4.1.1.4**

B. State Generator's ID **IL ID#1554**
C. State Transporter's ID **(317) 361-6646**

7. Transporter 2 Company Name
8. US EPA ID Number

D. Transporter's Phone
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
HERITAGE ENVIRONMENTAL SERVICES
7901 W. MORRIS ST.
INDIANAPOLIS IN 46231 10. US EPA ID Number **I.N.D.0.9.3.2.1.9.0.1.2**

G. State Facility's ID **BRIN03**
H. Facility's Phone **(317) 486-2898**

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers		13. Total Quantity	14. Unit Wt/Vol.	15. Waste No.
	No.	Type			
a. HAZARDOUS WASTE, SOLID, N.O.S., 9, NA3077, PGIII (D004, D005, D006, D007, D008, D010, D011) ERG# 171	0.01	DM	XX.30	P	D004
b. HAZARDOUS WASTE, LIQUID, N.O.S., 9, NA3082, PGIII (D004, D005, D006, D007, D008, D010, D011) ERG# 171	0.01	DM	XX.30	G	D004
c.					
d.					

J. Additional Descriptions for Materials Listed Above
A) 46002-2; D005, D006, D007, D008, D010, D011
B) 46002-1; D005, D006, D007, D008, D010, D011 K. Handling Codes for Wastes Listed Above
A) S01 B) T21

15. Special Handling Instructions and Additional Information
VEHICLE LICENSE# IAG 4-3074 **SITE ADDRESS: 3576 CHEMETCO LANE**
24 HR EMERGENCY# 317-486-2898 **HARTFORD, IL 62048**

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name **Kurt K. Kuebler** Signature **[Signature]** Date **3-5-94**

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name **Sean Redington** Signature **[Signature]** Date **3-5-94**

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted item 19.
Printed/Typed Name **MICHAEL SWARTZ** Signature **[Signature]** Date **06/06/94**

INA1111612

National Response Center at 800/424-8802 or 202/426-2675.



Equipment: 4504 HERITAGE ENVIRONMENTAL SERVI
 Contact: ACCOUNTS PAYABLE (317)388-3500
 PO number(s): 14-05197
 Location(s): 48-1

HERITAGE ENVIRONMENTAL SERVICES, INC.
 7901 WEST MORRIS STREET INDIANAPOLIS IN 46231
 (317)243-0811 http://www.heritage-enviro.com

Signature _____ Name (please print) _____ Date _____

This is to certify that the materials listed below are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

KEVIN HIGGINS
 USEPA REGION V - CHEMETRO, INC
 3576 CHEMETRO LANE
 WARTFORD IL 62048

STATE ID:
 EPA ID: ILP200000130
 Phone: (913)236-0006
 GENERATOR: 46002 XX *M*

INTL
 LINER _____
 PUMP/HOSE _____
 DEMURRAGE _____
 EMER RATE _____

TRANSPORTER: 0000
 HERITAGE TRANSPORT

EPA ID: IND058484114
 Phone: (317)381-4349

DRIVER# 3953
 ROLLOFF#
 TRACTOR# 199
 TRAILER# 31-12

Signature Bob Dyer Name (please print) B. DYER Date 6/1/98

As transporter, I accept this material for transportation in accordance with all applicable regulations.

TSDF: 5000

HERITAGE ENVIRONMENTAL SERVICES, INC.
 7901 WEST MORRIS STREET
 INDIANAPOLIS IN 46231

EPA ID: IND093219012
 Phone: (317)243-0811
 Contact: WINDE HAMRICK

DEMURRAGE _____ INTL _____

Signature [Signature] Name (please print) M. WALTER Date 6/6/98

As receiving facility, I accept this material for treatment, storage or disposal in accordance with all applicable regulations.

sa Prod HSE Doc Common Name	RCRA GenDoc State Manifest	Pg Ln/Ordered/Shipped	Received Qty
1 53 748865 BENZONIZED WATER CONTAM. W HEAVY METALS	Y 00001 INA 111612	1/1	1 DM
DT: HAZARDOUS WASTE, LIQUID, N.O.S., 9, NA3082, PG III, (METAL CONTAMINATED WATER) (D004, D005, D006, D007, D008, D010, D011)			
IL Auth# N/A Tank:	Quote: 150949 Scale: 556	Gallons:	LBS: 195

sa Prod HSE Doc Common Name	RCRA GenDoc State Manifest	Pg Ln/Ordered/Shipped	Received Qty
2 105 748866 TYVEK/PPE CONTAM. WITH HEAVY METALS	Y Same	1/1	1 DM
DT: HAZARDOUS WASTE, SOLID, N.O.S., 9, NA3077, PG III, (METAL CONTAMINATED PPE AND TYVEK) (D004, D005, D006, D007, D008, D010, D011)			
IL Auth# N/A Tank:	Quote: 150953 Scale: 556	Gallons:	LBS: 67

sa Prod HSE Doc Common Name	RCRA GenDoc State Manifest	Pg Ln/Shipped Quantity	Received Qty
IL Auth# Tank:	Quote: Scale:	Gallons:	LBS:

EMERGENCY CHEMICAL ASSISTANCE TELEPHONE NUMBER: 1-800-927-5221

LAST PAGE

MAIL TO GENERATOR

APPENDIX F

USGS TOPOGRAPHIC MAP

FIELD SAMPLING AND ANALYSIS REPORT

**CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809**

TABLE 4. AGRICULTURAL SOURCES OF INORGANIC CONTAMINATION IN SOILS (PPM DW)^a
(KABATA-PENDIAS AND PENDIAS 1984).

Element	Sewage sludges	Phosphate fertilizers	Limestones	Nitrogen fertilizers	Manure	Pesticides (%)
As	2-26	2-1,200	0.1-24.0	2.2-120	3-25	22-60
B	15-1,000	5-115	10	-	0.3-0.6	-
Ba	150-4,000	200	120-250	-	270	-
Be	4-13	-	1	-	-	-
Br	20-165	3-5	-	185-716	16-41	20-85
Cd	2-1,500	0.1-170	0.04-0.1	0.05-8.5	0.3-0.8	-
Ce	20	20	12	-	-	-
Co	2-260	1-12	0.4-3.0	5.4-12	0.3-24	-
Cr	20-40,600	66-245	10-15	3.2-19	5.2-55	-
Cu	50-3,300	1-300	2-125	<1-15	2-60	12-50
F	2-740	8,500-38,000	300	-	7	18-45
Ge	1-10	-	0.2	-	19	-
Hg	0.1-55	0.01-1.2	0.05	0.3-2.9	0.09-0.2	0.8-42
In	-	-	-	-	1.4	-
Mn	60-3,900	40-2,000	40-1,200	-	30-550	-
Mo	1-40	0.1-60	0.1-15	1-7	0.05-3	-
Ni	16-5,300	7-38	10-20	7-34	7.8-30	-
Pb	50-3,000	7-225	20-1,250	2-27	6.6-15	60
Rb	4-95	5	3	-	0.06	-
Sc	0.5-7	7-36	1	-	5	-
Se	2-9	0.5-25	0.08-0.1	-	2.4	-
Sn	40-700	3-19	0.5-4.0	1.4-16.0	3.8	-
Sr	40-360	25-500	610	-	80	-
Te	-	20-23	-	-	0.2	-
U	-	30-300	-	-	-	-
V	20-400	2-1,600	20	-	-	45
Zn	700-49,000	50-1,450	10-450	1-42	15-250	1.3-25
Zr	5-90	50	20	-	5.5	-

a. Equivalent to mg/kg-DW.

United States
Environmental Protection
Agency

Office of
Research and
Development

Office of Solid
Waste and
Emergency
Response

EPA/540/S-96/500
December 1995



Engineering Forum Issue

DETERMINATION OF BACKGROUND CONCENTRATIONS OF INORGANICS IN SOILS AND SEDIMENTS AT HAZARDOUS WASTE SITES

R. P. Breckenridge¹ and A. B. Crockett¹

Post-it	Date	# of pages
Fax Note R7673	2/5	2
To	Kestner	
Fax#		
From	Cindy	
Phone#		

INTRODUCTION

The National Engineering Forum is a group of U.S. Environmental Protection Agency (EPA) professionals representing EPA Regional Offices, committed to the identification and resolution of engineering issues affecting the remediation of Superfund sites. The forum has identified the need to provide remedial project managers (RPMs) and other state or private personnel working with hazardous waste sites a thought-provoking, technical-issue paper on how to determine background concentrations of inorganics in soils and sediments at hazardous waste sites. Mr. Frank Vavra and Mr. Bob Stamnes, Engineering Forum members, provided

technical guidance and direction in the development of this Issue paper.

This paper was prepared by R. P. Breckenridge and A. B. Crockett. Support for this project was provided by the National Exposure Research Laboratory's Characterization Research Division with the assistance of the Superfund Technical Support Project's Technology Support Center for Monitoring and Site Characterization. For further information, contact Ken Brown, Technology Support Center Director, at (702) 798-2270, or R. P. Breckenridge at (208) 526-0757, U.S. Department of Energy, Idaho National Engineering Laboratory.

¹ U.S. Department of Energy, Idaho National Engineering Laboratory.



Technology Support Center for
Monitoring and Site Characterization,
Characterization Research Division
Las Vegas, NV 89193-3478

Technology Innovation Office
Office of Solid Waste and Emergency Response,
U.S. EPA, Washington, D.C.

Walter W. Kovalick, Jr., Ph.D., Director



Printed on Recycled Paper

PROTECTED UNDER INTERNATIONAL COPYRIGHT
ALL RIGHTS RESERVED.
NATIONAL TECHNICAL INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE

REPRODUCED BY: NIST
U.S. Department of Commerce
National Technical Information Service
Springfield, Virginia 22161

764asb95



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SEP 17 1998

DE-9J

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Heather Young
Chemetco, Inc.
P.O. Box 187
Route 3 and Oldenberg Road
Hartford, Illinois 62048

Re: Sample Results
Chemetco
ILD 048 843 809

Dear Ms. Young:

Enclosed please find the results of sample analysis completed for samples collected by the United States Environmental Protection Agency Region 5, Enforcement and Compliance Assurance Branch during May, 1998.

If you have any questions, please contact me at (312)353-6268.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Patrick F. Kuefler".

Patrick F. Kuefler
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

Enclosure

cc: Chris Cahnovsky, IEPA-Collinsville (w/encl.)

208

Cindy

MEMORANDUM

Date: September 23, 1998
To: George von Stamwitz, John Suarez, Bruce Hendrickson
From: Heather Young, CSD Environmental Services, Inc.
RE: USEPA's May sampling event

CONFIDENTIAL & PRIVILEGED WORK DOCUMENT

Attached are tables which include both results of Chemetco's analyses and USEPA's analyses of soil, sediment, surface water, and background samples taken on May 28 and 29, 1998. Chemetco took splits on the slag and brick samples but not the baghouse dust or zinc oxide. The slag and brick samples have been held but have not been analyzed yet. I also include sample location maps from the USEPA report.

As expected, the main constituents of concern are lead and cadmium. Many samples do show quite a difference in concentrations between the USEPA and Chemetco samples. Sometimes Chemetco's sample results are higher sometimes they are lower (please see tables for specifics). For the most part, I did not go through each test result and compare it against our analyses in this memo since this is self evident by review of the attached tables.

Surface water - USEPA sampling shows elevated concentrations (above NPDES discharge limits) of: cadmium in 2 of the 3 samples taken south of the truck lot and the east canal sample; and, of lead in the 3 samples south of the truck lot, east canal sample, and east of the slag pile near the fines storage area. The three surface water samples taken from Long lake show concentrations for all 8 RCRA metals were either below available discharge limits or were undetected. Some of the aforementioned exceedences were confirmed by Chemetco's analyses and some were not. The USEPA analysis of surface water from the east canal shows a lead concentration of less than 5 ppm. Cadmium was detected at 0.405 mg/L. No elevated levels of the other constituents were detected.

Soil sampling - The highest lead concentration ~~of lead~~ found by USEPA was at the south edge of the truck lot, 23200 ppm (SS003) although this concentration is not confirmed by Chemetco's sample. This same sample was subjected to TCLP which resulted in a value of 22.7 ppm (Chemetco 26.8 ppm). Actually all four samples at the south edge of the truck lot are above the 5ppm lead standard for TCLP and well above the Industrial exposure cleanup objective for lead, 400 ppm. Three of the four samples taken in the former refractory brick area resulted in concentrations of lead above 5 ppm also. All four of these samples are also above 400 ppm clean up standard for lead (industrial exposure #). Further remediation/clean-up of this area will probably be required by USEPA. Soil samples taken along the east edge of the plant (fencing) and at the northeast corner were below the 5ppm TCLP. Two of the five samples (SS009 and SS010) were above the 400 ppm clean up standard for lead (industrial exposure #).

Sediment sampling - As expected, the highest lead and cadmium concentrations were found in the east canal, 22600 ppm and 3450 ppm, respectively (Chemetco sample was 21700 ppm and 1390 ppm). Since high levels of metals are expected in the stormwater canals anyway, I suppose the issue is more what is the material. Is the material a hazardous waste? Silver was determined by USEPA to be at 62.8 ppm (Chemetco's sample was 0.59 ppm). 2 of the 3 sediment samples taken in Long Lake show concentrations above the 400 ppm (industrial exposure #). 1 of the 3 sediment samples taken south of the toe of the truck lot was slightly above the 400 ppm (at 433 ppm) although this is not confirmed by Chemetco's sample (186 ppm).

Background Sampling - When soil samples are compared to USEPA average background samples for lead and cadmium, 74.6 and 1.49 ppm, respectively, the greatest impacts appears to be regarding lead and cadmium. Pursuant to USEPA, the highest lead concentration was found in SS003, south edge of truck lot, at 23200 ppm (Chemetco's sample = 4340 ppm) and the highest cadmium concentration was found in SS007, former refractory brick area, at 60.1 ppm (Chemetco's sample = 29.3).

Slag samples - All 20 slag samples subjected to TCLP analysis by USEPA were above 5 ppm for lead with the highest concentration of 79.9 mg/L in SL-009. Cadmium concentrations for two of the 20 samples were above 1.0 TCLP limit for cadmium. They do say in the report that the 20 samples are representative of the slag on site.

Zinc oxide - These results are not surprising. The bunker is a RCRA unit and will be closed as such. The current generation of zinc oxide (ZO-004) is a product not a waste. It is not disposed of. The zinc oxide, as I understand it, in the bunker is there due to speculative accumulation. Samples from the bunker show a variance which is to be expected, in part probably due to mixing with dirt, etc... We expect zinc oxide to fail TCLP analysis. Obviously, USEPA is trying to gather data to say that the zinc oxide is a hazardous waste.

Baghouse dust - Again, we expect the baghouse dust to fail TCLP for lead and cadmium. Since the material is reused in DIS, it is not a waste. If disposed of, this would be hazardous waste.

Refractory brick - USEPA subjected brick samples to TCLP analysis only, not total metals analysis. 2 of the 6 samples were above 5.0 ppm for lead (33.0 and 6.7 ppm) and above 1.0 ppm for Cadmium (2.21 and 1.35 ppm).

Conclusion

Based on the USEPA results, I believe they will require additional excavation of the former refractory brick area. They may also want additional remediation in Long Lake, although most of the lead concentrations are not that far above the 400 ppm TACO industrial exposure standard with the exception of SD-001 (1100 ppm USEPA, 410 ppm Chemetco). As you are aware, IEPA wants different (presumably lower) clean-up objectives than the 400 ppm for lead.

It appears based on USEPA sample results that the southern edge of the truck lot exhibits very high concentrations of lead and cadmium. I believe that the truck lot will be subjected to further scrutiny. One question associated with the lot is, "Are these samples representative of the truck lot as a whole?". Lead concentrations at the toe of the truck lot (sediment samples) are lower than the south edge (soil samples). One sample is actually right at the background soil concentration. I can only assume that USEPA is looking to see if the truck lot has impacted the "wetlands" south of the lot.

Soil samples taken along the east edge and the northeast corner of the facility along the fence and subjected to TCLP analysis resulted in concentrations below the regulatory limits for cadmium and lead. Along the east side, soil samples are above background for lead and cadmium. The sediment sample (SD-008) taken along the east side and analyzed for total metals showed a lead level of 1490 ppm (Chemetco - 1532 ppm). This concentration is similar to USEPA soil sample results SS-009, SS-010, and SS-011 (1120, 2380, and 359 ppm, respectively) which were also collected along the east fence (Chemetco #'s = 880, 872, and 338, respectively). The surface water sample SW-008 showed lead concentrations above a NPDES discharge limit but below 5 ppm. Where the sediment and surface water sample was taken, there were slag fines present. This could have affected these results. If USEPA attacks this area, I think we can show that the sample results show very little impact. There did appear to be escape of some stormwater runoff along the east fence. Therefore, I would recommend that Chemetco proceed with installing drainage along the east fence as proposed in the Stormwater Pollution Prevention Plan sooner rather than later. This may head off USEPA a bit.

Sample results from the east canal exhibit high lead and cadmium concentrations in the sediment but not the water. Since we don't expect the water to be clean, I would assume that the question becomes, "Is the material disposed of when it is accumulated in the canals? Is it managed? Is it a hazardous waste? Is it product that is collected in the stormwater canals which contains recoverable materials, etc.?"

Obviously, based on USEPA analytical results, I would anticipate that USEPA will say the slag fails the 5.0 ppm TCLP regulatory limit, has been speculatively accumulated, and is, therefore, a hazardous waste.

Although the Techlaw (USEPA) report states that the slag passed an EPTOX evaluation in the 80's, it is prefaced by referring to the high total lead levels exhibited even back then. Since we have kept the split samples, please let me know if you want any of these splits analyzed.

Zinc oxide and baghouse dust was expected to fail TCLP analysis. If either of these materials are disposed of, they would be hazardous waste and must be disposed of as such. Currently, baghouse dust is reused in the DIS and zinc oxide is a product and sold. They are probably trying to buildup data for their case if they feel that these materials are not being utilized appropriately and should, consequently, be disposed of as hazardous waste.

Only one of the six brick samples was significantly higher (33.0 ppm) than the 5 ppm TCLP regulatory limit for lead. We do have this split, please let me know if you want me to have it analyzed. Although a second sample was above the regulatory limit, it was only 6.7 ppm for lead. I'm sure this presents them with a bit of a dilemma (as I see it) since only one brick sample significantly failed for lead. They want to identify the brick as a hazardous waste due to speculative accumulation. They can't do this if the sampling does not support it. I don't know what percentage of a population has to pass/fail for a material to be categorized as a hazardous waste. USEPA or IEPA's position may be that if one sample fails, they all fail. An average lead concentration from the 6 samples is approximately 6.6 ppm. Of course, This average is greatly skewed based on one sample result.

CHEMETCO/USEPA SPLIT SAMPLING - SOIL SAMPLING²*

Sample #	Ag	Ba	Cd	TCLP Cd(mg/L)	Cr	Pb	TCLP Pb(mg/L)	Hg	As	Se
SS001	8/1.90	369/310	74.3/51.40	1.58 mg/l/1.67	44.5/21.4	4170/3880	31.5 mg/l/26.5	0.29/0.459 J	9.49/24.7	<1.0/16.4
SS002	2/3.4	335/481	18.6/27.50	-- /0.74	18.4/37.7	2340/2300	20.4 mg/l/11.5	0.06/0.199 J	1.04/68.1 U	<1.0/68.1
SS003	2.2/40.40	277/253	16.7/30.80	-- /0.79	99.7/488	4340/23200	26.8 mg/l/22.7	0.15/0.46 J	2.84/200 U	0.61/40.4
SS004	8/0.97	206/173	37.1/46.60	1.99 mg/l/1.64	85.5/38.8	4230/4690	29.2 mg/l/20.3	0.08/0.399 J	6.17/22.1	0.84/0.97
SS005	3/0.6 U	180/195	1.48/5.91	-- /N/A	21.7/11.5	1380/639	4.1 mg/l/N/A	0.04/0.076 J	4.99/14.9	<0.5/11.5
SS006	0.84/2.51	230/260	34.3/13.90	0.45 mg/l/0.30	28.2/19.1	2370/2450	17.7 mg/l/14.2	0.03/0.102 J	3.84/17.6	0.59/11.2
SS007	0.60/15.30	240/261	29.3/60.10	0.87 mg/l/0.99	25.4/20.8	2780/3280	13.6 mg/l/16.1	0.08/0.255 J	20.9/46.2	1.03/12.5
SS008	0.71/14.00	288/482	67.7/45.00	0.89 mg/l/0.73	27.2/31.4	4510/8510	57.9 mg/l/23.7	0.19/0.412 J	6.78/131 U	0.68/131
SS009	0.62/1.11	257/265	14.4/18.80	-- /0.19	21.1/14.40	880/1120	1.21 mg/l/1.41	0.12/0.127 J	12.3/21.1	0.56/11.7
SS010	0.52/0.70	233/549	9.02/16.00	-- /0.12	26.0/25.7	872/2380	0.69 mg/l/1.10	0.081/0.191 J	8.31/24.1	1.11/15.4
SS011	0.62/0.5 U	256/282	1.60/4.96	-- /N/A	23.1/14.8	388/359	0.43 mg/l/N/A	0.051/0.075 J	5.66/13.7	0.19/9.6
SS012	0.50/0.5 U	261/250	0.54/2.95	-- /N/A	19.9/12.8	167/179	0.13 mg/l/N/A	0.040/0.048 J	4.67/14.1	0.44/9.8
SS013	0.44/0.5 U	251/244	<0.04/2.12	-- /N/A	19.6/11.1	121/124	<0.1 mg/l/N/A	0.034/0.037 J	3.57/10.8 U	0.23/10.8

² Results of TOTAL analyses are in micrograms/gram or mg/kg or ppm unless otherwise indicated

*See attached table for cleanup objectives based on TACO guidance

Italics represent USEPA results of split sample.

Chemetro
USEPA
both = to ppm

CHEMETCO/USEPA SPLIT SAMPLING - SURFACE WATER¹

Sample #	Ag/0.10	Ba/	Cd/0.15	Cr/0.1	Pb/0.20	Hg/	As/	Se/
SW-1	<0.005/0.005 U	0.080/0.083	0.015/0.0124	<0.010/0.010 U	0.067/0.050 U	<0.0002/0.0002 UJ	0.006/0.100 U	0.005/0.100 U
SW-2	<0.005/0.005 U	0.080/0.0782	0.008/0.0099	<0.010/0.010 U	0.027/0.050 U	<0.0002/0.0002 UJ	<0.005/0.100 U	0.006/0.100 U
SW-3	<0.005/0.005 U	0.106/0.0838	0.018/0.0094	<0.010/0.010 U	0.086/0.050 U	<0.0002/0.0002 UJ	0.011/0.100 U	<0.005/0.100 U
SW-4	0.011/0.0165	0.622/1.110	0.245/0.467	0.032/0.0521	5.02/12.500	0.0014/0.105 J	0.025/0.100 U	<0.05/0.100 U
SW-5	<0.005/0.005 U	0.152/0.154	0.055/0.0542	<0.010/0.010 U	0.565/0.481	<0.0002/0.0002 UJ	0.008/0.100 U	<0.05/0.100 U
SW-6	0.021/0.451	1.16/2.150	0.128/0.352	0.043/0.104	4.81/14.600	0.0040/0.00183 UJ	0.084/0.153	<0.125/0.107
SW-7	0.030/0.005 U	0.064/0.0768	0.416/0.405	0.014/0.0129	0.084/9.040	0.0075/0.00828 J	0.173/0.100 U	<0.5/0.348
SW-8	0.026/0.005 U	1.00/0.494	0.036/0.0197	0.140/0.0828	11.3/4.350	0.0062/0.00365 J	0.235/0.100 U	<0.5/0.294

*element/general discharge standard (NPDES)

¹Results of EC/JP analyses are in mg/L or ppm

Italics represent USEPA results of split sample. These concentrations were converted from micrograms/L as reported to mg/L.

"J" = Holding time exceeded, estimated concentrations

"U" = Undetected

USEPA SPLIT SAMPLING - SEDIMENT SAMPLES^{2*}

Sample #	Ag	Ba	Cd	Cr	Pb	Hg/	As	Se
SD-1	0.48/1.94	127/225	208/566	16.8/14	410/1100	0.18/0.38 J	2.67/23.9 U	5.86/23.9 U
SD-2	0.40/0.90 U	107/210	81.4/308	11.3/14.4	104/383	0.061/0.261 J	2.72/18.9 U	1.12/18.9 U
SD-3	0.53/1.63	168/239	54.9/98.10	20.9/16.4	405/652	0.11/0.148 J	2.79/15.2 U	1.48/15.2 U
SD-4	0.53/0.9 U	124/201	1.51/8.69	19.0/18.2	151/298	0.020/0.057 J	3.97/19.1	0.19/17.8 U
SD-5	0.56/1.1 U	135/246	0.91/6.95	18.9/17.0	186/433	0.033/0.102 J	3.92/22.4 U	0.34/22.4 U
SD-6	0.54/0.7 U	150/214	<0.04/4.65	20.9/16.7	26.4/79.8	0.014/0.07 J	3.33/18.8 U	<0.5/14.8 U
SD-7	0.59/62.8	134/2430	1390/3450	100/110	21700(2.17%)/22600	39.3/8.45 J	6.33/167	0.18/144 U
SD-8	0.50/0.08 J	253/313	2.16/8.69	44.7/23.8	1532/1490	0.059/0.08 J	5.63/12.6 U	0.60/12.6 U

² Results of TOTAL analyses are in micrograms/gram or mg/kg or ppm unless otherwise indicated

*See attached table for cleanup objectives based on TACO guidance

Italics represent USEPA results of split sample.

CHEMETCO/USEPA SPLIT SAMPLING - BACKGROUND SAMPLES²

Sample #	Location	*Ag	Ba	Cd	Cr	Pb	Hg	As	Se
Bkg-1	Between the truck lot and Long Lake	0.59/0.7 <i>U</i>	156/193	<0.1/1.82	22.9/18.6	64.6/112	0.02/0.071 <i>J</i>	2.58/17.9	<0.5/13.2 <i>U</i>
Bkg-2	40' east of driveway to farm	0.61/0.6 <i>U</i>	208/242	<0.1/1.29	27.8/79.0	22.3/55.5	0.03/0.037 <i>J</i>	3.61/16.6	0.75/12.3 <i>U</i>
Bkg-3	190' east of driveway to farm	0.54/0.5 <i>U</i>	186/247	<0.1/1.36	23.5/16.1	27.7/56.3	0.03/0.033 <i>J</i>	3.31/15.4	0.56/9.7 <i>U</i>

² Results of TC TAL analyses are in micrograms/gram or mg/kg or ppm unless otherwise indicated

Italics represent USEPA results of split sample.

MEAN	Background samples	Ag - 0.58/0.6 <i>U</i>	Ba - 183/227.3	Cd - <0.1/1.49	Cr - 24.7/37.9	Pb - 38.2/74.6	Hg - 0.027/0.047 <i>J</i>	As - 3.17/16.6	Se - 0.52/11.7 <i>U</i>
------	--------------------	------------------------	----------------	----------------	----------------	----------------	---------------------------	----------------	-------------------------

² Results of TC TAL analyses are in micrograms/gram or mg/kg or ppm unless otherwise indicated

Italics represent USEPA results of split sample

CLEAN-UP OBJECTIVES BASED ON TACO GUIDANCE

Chemical	Exposure Route-Specific Values for Soils		pH Specific Soil Remediation Objectives for Inorganics and Ionizing Organics for the Migration to GW Portion of the GW Ingestion Route (Class I GW)		Migration to GW Portion of the GW Ingestion Exposure Route Values
	Industrial-Commercial	Construction Worker	pH 7.25 to 7.4	pH 7.75 to 8.0	Class I (mg/L)
Silver	0,000 ^b	1,000 ^b	39	110	0.05 ^m
Arsenic ^{Ln}	61 ^b	61 ^b	30	31	0.05 ^m
Barium	40,000 ^b	14,000 ^b	1,800	2,100	2.0 ^m
Cadmium ^{Ln}	0,000 ^{b,r}	200 ^{b,r}	59	430	0.005 ^m
Chromium	0,000 ^b	4,100 ^b	32	28	0.1 ^m
Mercury ^{Ln}	0.10 ^b	61 ^{b,s}	6.4	8.0	0.002 ^m
Selenium ^{Ln}	0,000 ^b	1,000 ^b	3.3	2.4	0.0075 ^m
Lead	400 ^k	400 ^k	no listing	no listing	0.05 ^m

^bCalculated values correspond to a target hazard quotient of 1.

^cCalculated values correspond to a cancer risk level of 1 in 1,000,000. Site-specific conditions may warrant use of a greater risk level not to exceed 1 in 10,000.

^kA preliminary remediation goal of 400 mg/kg has been set for lead based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive #9355.4-12.

^rValue based on Dietary Reference Dose.

^sValue based on Reference Dose for Mercuric chloride (CAS No. 7487-94-7).

Note that Table value is likely to be less than background concentration for this chemical; screening or remediation concentrations using the procedures of Subpart D of this Part.

Table 4.1.1
Waste Slag TCLP Metal Concentrations
(mg/L)

Split taken
Split not analyzed

RCRA Metal	SL-001	SL-002	SL-003	SL-004	SL-005	SL-006	SL-007	SL-008	SL-009	SL-010
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.7	1.6	1.0	0.9	0.4	1.7	1.6	1.2	1.4	1.8
Cadmium	0.16	0.93	0.50	0.58	0.01	0.51	0.66	0.16	0.39	0.32
Chromium	0.040	0.027	0.050	0.033	0.015	0.076	0.042	0.028	0.044	0.030
Lead	18.4	16.6	11.8	15.4	20.5	39.2	56.6	14.6	79.9	27.7
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

RCRA Metal	SL-011	SL-012	SL-013	SL-014	SL-015	SL-016	SL-017	SL-018	SL-019	SL-020
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.8	2.7	0.6	0.6	1.7	1.8	0.8	0.8	0.8	0.7
Cadmium	0.21	0.18	0.64	1.11	0.44	0.25	0.01	1.32	0.09	0.23
Chromium	0.031	0.017	0.037	0.058	0.033	0.130	0.020	0.022	0.042	0.030
Lead	54.4	17.2	43.9	50.6	56.0	21.0	38.2	67.7	37.8	17.0
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.200 U	0.100 U	0.100 U	0.200 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005

Table 4.1.2a
Zinc Oxide
Total Metal Concentrations
(mg/kg)

No Split Taken

RCRA Metal	ZO-001	ZO-002	ZO-003	ZO-004
Arsenic	359	193 U	110 U	130 U
Barium	1190	1580	3100	1280
Cadmium	2890	3280	704	3010
Chromium	100	56.6	50.4	76.9
Lead	40000	32000	18200	25400
Mercury	15.9 J	30.3 J	3.61 J	20.7 J
Selenium	198 U	193 U	110 U	130 U
Silver	43.70	55.50	25.80	105

Table 4.1.2b
Zinc Oxide
TCLP Metal Concentrations
(mg/L)

RCRA Metal	ZO-001	ZO-002	ZO-003	ZO-004
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.5	0.3	0.6	0.6
Cadmium	22.50	13.40	8.38	23.70
Chromium	0.010 U	0.010 U	0.010 U	0.010 U
Lead	8.5	23.8	58.8	213.0
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0005 J
Selenium	1.000 U	2.000 U	0.500 U	1.000 U
Silver	0.050 U	0.100 U	0.005 U	0.050 U

4.1.3 Baghouse Dust

Analytical results of baghouse dust samples for RCRA TCLP metals are presented in Table 4.1.3. All baghouse dust samples were above the TCLP regulatory limit for lead (5 mg/L) and cadmium (1 mg/L).

The TCLP lead concentrations range from 835 mg/L for the No. 1 Baghouse (BD-001) to 27.4 mg/L for the No. 2 Baghouse/Roof Baghouse (BD-002). The Primary Baghouse of the Slag Granulation Plant (BD-003) and the Secondary Baghouse of the Slag Granulation Plant (BD-004) have TCLP lead concentrations of 89.5 mg/L and 48.3 mg/L, respectively.

The TCLP cadmium concentrations range from 56.0 mg/L for the Secondary Baghouse of the Slag Granulation Plant (BD-004) to 7.97 mg/L for the Primary Baghouse of the Slag Granulation Plant (BD-003). The No. 1 Baghouse (BD-001) and the No. 2 Baghouse/Roof Baghouse (BD-002) have TCLP cadmium concentrations of 36.9 mg/L and 54 mg/L, respectively.

No baghouse dust samples were above the TCLP regulatory limits for arsenic, barium, chromium, mercury, selenium, or silver. No significant differences between the baghouse dust samples were noted with regard to arsenic, barium, chromium, mercury, selenium, or silver.

Table 4.1.3
Baghouse Dust
TCLP Metal Concentrations
(mg/L)

No split taken

RCRA Metal	BD-001	BD-002	BD-003	BD-004
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.2	0.1	0.3	0.1
Cadmium	36.90	54.00	7.97	56.00
Chromium	0.010 U	0.037	0.010 U	0.010 U
Lead	835	27.4	89.5	48.3
Mercury	0.0006 J	0.11 J	0.0016 J	0.0002 J
Selenium	2.000 U	10.00	0.800 U	0.600 U
Silver	0.100 U	0.500 U	0.005 U	0.005 U

4.1.4 Spent Refractory Brick

Analytical results of spent refractory brick samples for RCRA TCLP metals are presented in Table 4.1.4. Two brick samples (RB-001 and RB-006) are above the TCLP regulatory limit for both lead

(5 mg/L) and cadmium (1/mg/L). All other brick samples are below the TCLP regulatory limits for all RCRA metals.

Brick sample RB-006, with high TCLP lead (6.7 mg/L) and cadmium (1.35 mg/L), represents a composite sample of three areas of brick pieces and associated brick pile material. The material composited for RB-006 represented a visibly significant portion of the spent refractory brick pile (Photos 36, 37). 7

Table 4.1.4
Spent Refractory Brick
TCLP Metal Concentrations
(mg/L)

*split taken
not
split analyzed*

RCRA Metal	RB-001	RB-002	RB-003	RB-004	RB-005	RB-006
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	1.0	0.2	0.2	0.5	0.2	1.2
Cadmium	2.21	0.005 U	0.005 U	0.005 U	0.005 U	1.35
Chromium	0.066	0.010 U	2.020	0.010 U	0.852	0.010 U
Lead	33.0	0.1	0.050 U	0.050 U	0.050 U	6.7
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SEP 17 1998

DE-9J

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Heather Young
Chemetco, Inc.
P.O. Box 187
Route 3 and Oldenberg Road
Hartford, Illinois 62048

Re: Sample Results
Chemetco
ILD 048 843 809

Dear Ms. Young:

Enclosed please find the results of sample analysis completed for samples collected by the United States Environmental Protection Agency Region 5, Enforcement and Compliance Assurance Branch during May, 1998.

If you have any questions, please contact me at (312)353-6268.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Patrick F. Kuefler".

Patrick F. Kuefler
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

Enclosure

cc: Chris Cahnovsky, IEPA-Collinsville (w/encl.)

DRAFT

December 18, 1998

Mr. Patrick F. Kuefler
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division
USEPA, Region 5
77 West Jackson Blvd.
Chicago, IL 60604-3590

Dear Mr. Kuefler,

Attached are the results of the split samples that were analyzed by Chemetco as a result of the United States Environmental Protection Agency Region 5, Enforcement and Compliance Assurance Branch's sampling effort undertaken on May 28 and 29, 1998.

Upon initial comparison of sample results obtained from the split samples of sediment, soil, and surface water collected and placed in sample jars by Techlaw personnel for myself and Cindy Davis, CSD Environmental Services, Inc., who represented Chemetco, Inc., several discrepancies have been noted. For example, lead concentrations reported by USEPA in three surface water samples, SW-4, SW-6, and SW-7, are 2.5, 3, and 112, respectively, times the sample result obtained by Chemetco. Also, another example of a discrepancy is the total lead concentration reported by USEPA in the SS003. This sample is a little over five times the total lead concentration obtained by Chemetco. The corresponding TCLP lead result reported by both USEPA and Chemetco are very close. The aforementioned are just a few of the discrepancies noted.

Chemetco would also like to take this opportunity to point out that upon a visual review of the slag split samples, that a majority of the samples contained quite small particles which appear to be slag fines rather than slag. The slag sample collected by Techlaw/USEPA do not appear to be representative of the slag pile as it sits. We know that the smaller the physical particle size the greater the lead concentration can be due to the increase in surface area. Since all of these items can physically be segregated (proposed in the universal settlement agreement), if the samples taken from the slag pile contained fines, these are not representative of the slag itself. The analytical results may in fact show the influence of the slag fines and not actually provide a representative sample of the slag. In addition, the slag has already been declared nonhazardous based on an E.P. Toxicity study in 1988. The study and nonhazardous results were supported by the Illinois EPA. ,

In addition, please note that the narrative accompanying the sample results contained several factual and operational errors.

If you have any questions please contact me at (618)254-4381 ext. 268 with any questions.

Sincerely yours,

-17 pages of analyses
I included only a couple of ex. of lab sheets that would be attached.

DRAFT

Inorganic Laboratory Information

Organic Laboratory Information

INORGANIC PARAMETER GROUPS (Source of Methods: SW-846 except as superscripted)						ORGANIC TESTS (Source of Methods: SW-846 except as superscripted)				ORGANIC BOTTLES			
CONSTITUENT	GWDTOT	GWDRS	LEACH	SURFV	AWAST	VOC Volatiles by GC/MS F=Focused subset Method 8260 D=Drinking Water subset by GC Method 502.1 ¹	SVOC Semi-volatiles by GC/MS F=Focused subset Method 8270	Test	Bottles Required (by Matrix)	Water	Soil	Organic	
Affinity	310.1 ¹	310.1 ¹	310.1 ¹	—	—	1,1-Dichloroethane	FD	1,2-Dinitrobenzene	F	2(1) 40 ml vials ¹ + blank	2(1) 2 oz jars	(1) 2 oz jar	
Aluminum	6010A	6010A	200.7 ¹	200.7 ¹	6010A	1,1,2,2-Tetrachloroethane	D	1,2,4,5-Tetrachlorobenzene	F	2(1) 40 ml vials ¹ + blank	2(1) 2 oz jars	(1) 2 oz jar	
Ammonia-Nitrogen	350.1 ¹	350.1 ¹	350.1 ¹	350.1 ¹	—	1,1,2-Trichloroethane	D	1,4-Dinitrobenzene	F	2(1) 40 ml vials ¹ + blank	N/A	N/A	
Antimony	7041	7041	—	—	(1311) 7041	1,1,1-Trichloroethane	FD	1,3-Dinitrobenzene	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Arsenic	7060	7060	200.9 ¹	200.9 ¹	(1311) 7060	1,1,1,2-Tetrachloroethane	D only	1,2-Oxybis-1-chloropropane	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Barium	6010A	6010A	200.7 ¹	200.7 ¹	(1311) 6010A	1,2-Dichlorobenzene	D only	2,3,4,6-Tetrachlorophenol	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Beryllium	6010A	6010A	200.7 ¹	200.7 ¹	(1311) 6010A	1,2-Chlorophenylpropane	D	4-Chlorophenylphenyl ether	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Boron	6010A	6010A	200.7 ¹	200.7 ¹	6010A	1,2,3-Trichloropropane	D	4-Nitrophenyl	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Cadmium	6010A	6010A	200.7 ¹	200.7 ¹	(1311) 6010A	1,2,4-Trichlorobenzene	D only	4-Nitro-p-toluidine	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Calcium	6010A	6010A	200.7 ¹	200.7 ¹	6010A	1,3-Dichloropropane	D	7,12-Dimethylbenzoylbenzothioether	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Chloride	9251	925	335.2 ¹	335.2 ¹	—	1,3-Dichlorobenzene	D only	1,2,4-Trichlorobenzene	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Chromium	6010A	6010A	200.7 ¹	200.7 ¹	(1311) 6010A	1,1-Dichloropropane	D	1,4-Dichlorobenzene	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Cobalt	6010A	6010A	200.7 ¹	200.7 ¹	6010A	1,2-Dichloroethane	FD	1,3-Dichlorobenzene	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Copper	6010A	6010A	200.7 ¹	200.7 ¹	6010A	1,1-Dichloroethane	D	1,3-Dichlorobenzene	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Cyanide	9010A	—	335.4 ¹	335.4 ¹	9010A	1,4-Dichlorobenzene	D only	2,4-Dinitrobenzene	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Fluoride	340.2 ¹	340.2 ¹	340.2 ¹	340.2 ¹	—	2,2-Dichloropropane	D	2,4-Dichlorophenol	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Hardness	—	—	130.1 ¹	130.1 ¹	—	2-Chloroethylvinyl Ether	—	2,4-Dinitrophenol	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Iron	6010A	6010A	200.7 ¹	200.7 ¹	6010A	2-Hexanone (MIBK)	—	2,6-Dinitrophenol	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Lead	7421	742	200.9 ¹	200.9 ¹	(1311) 7421	4-Methyl-2-pentanone (MIBK)	—	2,4-Dimethylphenol	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Magnesium	6010A	6010A	200.7 ¹	200.7 ¹	6010A	Acetone	—	2,4,6-Trichlorophenol	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Manganese	6010A	6010A	200.7 ¹	200.7 ¹	6010A	Benzene	F	2,4,5-Trichlorophenol	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Mercury	7470A	7470A	245.1 ¹	245.1 ¹	7470A (1311) 7471A	Bromobenzene	D	2-Chloronaphthalene	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Nickel	6010A	6010A	200.7 ¹	200.7 ¹	(1311) 6010A	Bromochloromethane	D	2-Chlorophenol	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Nitrite & Nitrate	9200	9200	335.2 ¹	335.2 ¹	—	Bromomethane	D	2-Methylphenol	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
pH	9040A	—	150.1 ¹	150.1 ¹	9040A	Carbon Tetrachloride	FD	2-Nitrophenol	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Phenols	9066	—	410.4 ¹	410.4 ¹	9066	Carbon Disulfide	FD	2-Nitroaniline	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Phosphorus	365.1 ¹	365.1 ¹	365.1 ¹	365.1 ¹	—	Chlorobenzene	D	3-Chlorobenzidine	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Potassium	6010A	6010A	200.7 ¹	200.7 ¹	6010A	Chlorobromomethane	D	3-Nitroaniline	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Selenium	7740	7740	200.9 ¹	200.9 ¹	(1311) 7740	Chlorobromomethane	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Silver	6010A	6010A	200.7 ¹	200.7 ¹	(1311) 6010A	Chloroform	FD	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Sodium	6010A	6010A	200.7 ¹	200.7 ¹	6010A	Chloroform	FD	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Specific Conductance	9050	—	120.1 ¹	120.1 ¹	—	Chloromethane	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Strontium	6010A	6010A	200.7 ¹	200.7 ¹	6010A	Chloroform	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Sulfate	9036	9036	375.2 ¹	375.2 ¹	—	Chloroform	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Sulfide	—	—	376.1 ¹	376.1 ¹	9031	Chloroform	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Thallium	7841	7841	200.9 ¹	200.9 ¹	(1311) 7841	Chloroform	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Total Dissolved Solids (TDS)	160.1 ¹	—	160.1 ¹	160.1 ¹	—	Chloroform	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Total Suspended Solids (TSS)	—	—	160.2 ¹	160.2 ¹	—	Chloroform	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Total Organic Carbon (TOC)	—	—	415.1 ¹	415.1 ¹	9060	Chloroform	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Vanadium	6010A	6010A	200.7 ¹	200.7 ¹	(1311) 6010A	Chloroform	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	
Zinc	6010A	6010A	200.7 ¹	200.7 ¹	6010A	Chloroform	D	Isophthalic acid	F	(1) 80 oz bottle ^{1,2}	(1) 8 oz jar ¹	(1) 8 oz jar	

SW-846 = Test Methods for Evaluating Solid Waste EPA 600/R-94/111 = Methods for the Determination of Metals in Environmental Samples EPA 600/4-79-020 = Methods for Chemical Analysis of Water and Wastes EPA 500-series = Methods for the Determination of Organic Compounds in Drinking Water, Supplement I, II, and III

CHEMETCO/USEPA SPLIT SAMPLING - SURFACE WATER¹

Sample #	*Ag/0.10	Ba/	Cd/0.15	Cr/0.1	Pb/0.20	Hg/	As/	Se/
SW-1	<0.005/0.005 U	0.080/0.083	0.015/0.0124	<0.010/0.010 U	0.067/0.050 U	<0.0002/0.0002 UJ	0.006/0.100 U	0.005/0.100 U
SW-2	<0.005/0.005 U	0.080/0.0782	0.008/0.0099	<0.010/0.010 U	0.027/0.050 U	<0.0002/0.0002 UJ	<0.005/0.100 U	0.006/0.100 U
SW-3	<0.005/0.005 U	0.106/0.0838	0.018/0.0094	<0.010/0.010 U	0.086/0.050 U	<0.0002/0.0002 UJ	0.011/0.100 U	<0.005/0.100 U
SW-4	0.011/0.0165	0.622/1.110	0.245/0.467	0.032/0.0521	5.02/12.500	0.0014/0.105 J	0.025/0.100 U	<0.05/0.100 U
SW-5	<0.005/0.005 U	0.152/0.154	0.055/0.0542	<0.010/0.010 U	0.565/0.481	<0.0002/0.0002 UJ	0.008/0.100 U	<0.05/0.100 U
SW-6	0.021/0.451	1.16/2.150	0.128/0.352	0.043/0.104	4.81/14.600	0.0040/0.00183 UJ	0.084/0.153	<0.125/0.107
SW-7	0.030/0.025 U	0.064/0.0768	0.416/0.405	0.014/0.0129	0.084/9.040	0.0075/0.00828 J	0.173/0.100 U	<0.5/0.348
SW-8	0.026/0.025 U	1.00/0.494	0.036/0.0197	0.140/0.0828	11.3/4.350	0.0062/0.00365 J	0.235/0.100 U	<0.5/0.294

*element/general discharge standard (NPDES)

¹Results of TCLP analyses are in mg/L or ppm

Italics represent USEPA results of split sample. These concentrations were converted from micrograms/L as reported to mg/L.

"J" = Holding time exceeded, estimated concentrations

"U" = Undetected

CHEMETCO/USEPA SPLIT SAMPLING - SOIL SAMPLING²*

Sample #	Ag	Ba	Cd	TCLP Cd _(mg/L)	Cr	Pb	TCLP Pb _(mg/L)	Hg	As	Se
SS001	1.8/1.90	369/310	74.3/51.40	1.58 mg/L/1.67	44.5/21.4	4170/3880	31.5 mg/L/26.5	0.29/0.459 J	9.49/24.7	<1.0/16.5
SS002	1.2/3.4	335/481	18.6/27.50	-- /0.74	18.4/37.7	2340/2300	20.4 mg/L/11.5	0.06/0.199 J	1.04/68.1 U	<1.0/68.1
SS003	2.2/40.40	277/253	16.7/30.80	-- /0.79	99.7/488	4340/23200	26.8 mg/L/22.7	0.15/0.46 J	2.84/200 U	0.61/40.5
SS004	1.8/0.97	206/173	37.1/46.60	1.99 mg/L/1.64	85.5/38.8	4230/4690	29.2 mg/L/20.3	0.08/0.399 J	6.17/22.1	0.84/0.97
SS005	1.3/0.6 U	180/195	1.48/5.91	-- /N/A	21.7/11.5	1380/639	4.1 mg/L/N/A	0.04/0.076 J	4.99/14.9	<0.5/11.5
SS006	0.84/2.51	230/260	34.3/13.90	0.45 mg/L/0.30	28.2/19.1	2370/2450	17.7 mg/L/14.2	0.03/0.102 J	3.84/17.6	0.59/11.2
SS007	0.60/16.30	240/261	29.3/60.10	0.87 mg/L/0.99	25.4/20.8	2780/3280	13.6 mg/L/16.1	0.08/0.255 J	20.9/46.2	1.03/12.3
SS008	0.71/14.00	288/482	57.7/45.00	0.89 mg/L/0.73	27.2/31.4	4510/8510	57.9 mg/L/23.7	0.19/0.412 J	6.78/131 U	0.68/131
SS009	0.62/1.11	257/265	14.4/18.80	-- /0.19	21.1/14.40	880/1120	1.21 mg/L/1.41	0.12/0.127 J	12.3/21.1	0.56/11.7
SS010	0.52/9.70	283/549	9.02/16.00	-- /0.12	26.0/25.7	872/2380	0.69 mg/L/1.10	0.081/0.191 J	8.31/24.1	1.11/15.4
SS011	0.62/9.5 U	256/282	1.60/4.96	-- /N/A	23.1/14.8	388/359	0.43 mg/L/N/A	0.051/0.075 J	5.66/13.7	0.19/9.6
SS012	0.50/9.5 U	261/250	0.54/2.95	-- /N/A	19.9/12.8	167/179	0.13 mg/L/N/A	0.040/0.048 J	4.67/14.1	0.44/9.8
SS013	0.44/9.5 U	251/244	<0.04/2.12	-- /N/A	19.6/11.1	121/124	<0.1 mg/L/N/A	0.034/0.037 J	3.57/10.8 U	0.23/10.8

² Results of TOTAL analyses are in micrograms/gram or mg/kg or ppm unless otherwise indicated

*See attached table for cleanup objectives based on TACO guidance

Italics represent USEPA results of split sample.

Chemetro
USEPA
both = to ppm

USEPA SPLIT SAMPLING - SEDIMENT SAMPLES²*

Sample #	Ag	Ba	Cd	Cr	Pb	Hg/	As	Se
SD-1	0.48/1.94	127/225	208/566	16.8/14	410/1100	0.18/0.38 J	2.67/23.9 U	5.86/23.9 U
SD-2	0.40/0.90 U	107/210	81.4/308	11.3/14.4	104/383	0.061/0.261 J	2.72/18.9 U	1.12/18.9 U
SD-3	0.53/1.63	168/239	54.9/98.10	20.9/16.4	405/652	0.11/0.148 J	2.79/15.2 U	1.48/15.2 U
SD-4	0.53/0.9 U	124/201	1.51/8.69	19.0/18.2	151/298	0.020/0.057 J	3.97/19.1	0.19/17.8 U
SD-5	0.56/1.1 U	135/246	0.91/6.95	18.9/17.0	186/433	0.033/0.102 J	3.92/22.4 U	0.34/22.4 U
SD-6	0.54/0.7 U	150/214	<0.04/4.65	20.9/16.7	26.4/79.8	0.014/0.07 J	3.33/18.8 U	<0.5/14.8 U
SD-7	0.59/62.8	134/2430	1390/3450	100/110	21700(2.17%)/22600	39.3/8.45 J	6.33/167	0.18/144 U
SD-8	0.50/0.08 J	253/313	2.16/8.69	44.7/23.8	1532/1490	0.059/0.08 J	5.63/12.6 U	0.60/12.6 U

² Results of TOTAL analyses are in micrograms/gram or mg/kg or ppm unless otherwise indicated

*See attached table for cleanup objectives based on TACO guidance

Italics represent USEPA results of split sample.

CHEMETCO/USEPA SPLIT SAMPLING - BACKGROUND SAMPLES²

Sample #	Location	*Ag	Ba	Cd	Cr	Pb	Hg	As	Se
Bkg-1	Between the truck lot and Long Lake	0.59/0.7 <i>U</i>	156/193	<0.1/1.82	22.9/18.6	64.6/112	0.02/0.071 <i>J</i>	2.58/17.9	<0.5/13.2 <i>U</i>
Bkg-2	40' east of driveway to farm	0.61/0.6 <i>U</i>	208/242	<0.1/1.29	27.8/79.0	22.3/55.5	0.03/0.037 <i>J</i>	3.61/16.6	0.75/12.3 <i>U</i>
Bkg-3	19' east of driveway to farm	0.54/0.5 <i>U</i>	186/247	<0.1/1.36	23.5/16.1	27.7/56.3	0.03/0.033 <i>J</i>	3.31/15.4	0.56/9.7 <i>U</i>

² Results of TOTAL analyses are in micrograms/gram or mg/kg or ppm unless otherwise indicated
Italics represent USEPA results of split sample.

MEAN	Background samples	Ag - 0.58/0.6 <i>U</i>	Ba - 183/227.3	Cd - <0.1/1.49	Cr - 24.7/37.9	Pb - 38.2/74.6	Hg - 0.027/0.047 <i>J</i>	As - 3.17/16.6	Se - 0.52/11.7 <i>U</i>
------	--------------------	------------------------	----------------	----------------	----------------	----------------	---------------------------	----------------	-------------------------

² Results of TOTAL analyses are in micrograms/gram or mg/kg or ppm unless otherwise indicated
Italics represent USEPA results of split sample

CLEAN-UP OBJECTIVES BASED ON TACO GUIDANCE

Exposure Route-Specific Values for Soils			pH Specific Soil Remediation Objectives for Inorganics and Ionizing Organics for the Migration to GW Portion of the GW Ingestion Route (Class I GW)		Migration to GW Portion of the GW Ingestion Exposure Route Values
Chemical	Industrial-Commercial Ingestion (mg/kg)	Construction Worker Ingestion (mg/kg)	pH 7.25 to 7.4	pH 7.75 to 8.0	Class I (mg/L)
Silver	10,000 ^b	1,000 ^b	39	110	0.05 ^m
Arsenic ^{Ln}	3 ^{c,i}	61 ^b	30	31	0.05 ^m
Barium	140,000 ^b	14,000 ^b	1,800	2,100	2.0 ⁿ
Cadmium ^{Ln}	2,000 ^{b,i}	200 ^{b,i}	59	430	0.005 ^m
Chromium	10,000 ^b	4,100 ^b	32	28	0.1 ^m
Mercury ^{Ln}	610 ^b	61 ^{b,s}	6.4	8.0	0.002 ^m
Selenium ^{Ln}	10,000 ^b	1,000 ^b	3.3	2.4	0.0075 ^m
Lead	400 ^k	400 ^k	no listing	no listing	0.05 ^m

^bCalculated values correspond to a target hazard quotient of 1.

^cCalculated values correspond to a cancer risk level of 1 in 1,000,000. Site-specific conditions may warrant use of a greater risk level not to exceed 1 in 10,000.

^kA preliminary remediation goal of 400 mg/kg has been set for lead based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive #9355.4-

12

ⁱValue based on dietary Reference Dose.

^sValue based on Reference Dose for Mercuric chloride (CAS No. 7487-94-7).

Note that Table value is likely to be less than background concentration for this chemical; screening or remediation concentrations using the procedures of Subpart D of this Part.

Table 4.1.1
Waste Slag TCLP Metal Concentrations
(mg/L)

Split taken
Split not analyzed

RCRA Metal	SL-001	SL-002	SL-003	SL-004	SL-005	SL-006	SL-007	SL-008	SL-009	SL-010
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.7	1.6	1.0	0.9	0.4	1.7	1.6	1.2	1.4	1.8
Cadmium	0.16	0.93	0.50	0.58	0.01	0.51	0.66	0.16	0.39	0.32
Chromium	0.040	0.027	0.050	0.033	0.015	0.076	0.042	0.028	0.044	0.030
Lead	18.4	16.6	11.8	15.4	20.5	39.2	56.6	14.6	79.9	27.7
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

RCRA Metal	SL-011	SL-012	SL-013	SL-014	SL-015	SL-016	SL-017	SL-018	SL-019	SL-020
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.8	2.7	0.6	0.6	1.7	1.8	0.8	0.8	0.8	0.7
Cadmium	0.21	0.18	0.64	1.11	0.44	0.25	0.01	1.32	0.09	0.23
Chromium	0.031	0.017	0.037	0.058	0.033	0.130	0.020	0.022	0.042	0.030
Lead	54.4	17.2	43.9	50.6	56.0	21.0	38.2	67.7	37.8	17.0
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.200 U	0.100 U	0.100 U	0.200 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005

Table 4.1.2a
Zinc Oxide
Total Metal Concentrations
(mg/kg)

No Split Taken

RCRA Metal	ZO-001	ZO-002	ZO-003	ZO-004
Arsenic	359	193 U	110 U	130 U
Barium	1190	1580	3100	1280
Cadmium	2890	3280	704	3010
Chromium	100	56.6	50.4	76.9
Lead	40000	32000	18200	25400
Mercury	15.9 J	30.3 J	3.61 J	20.7 J
Selenium	198 U	193 U	110 U	130 U
Silver	43.70	55.50	25.80	105

Table 4.1.2b
Zinc Oxide
TCLP Metal Concentrations
(mg/L)

RCRA Metal	ZO-001	ZO-002	ZO-003	ZO-004
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.5	0.3	0.6	0.6
Cadmium	22.50	13.40	8.38	23.70
Chromium	0.010 U	0.010 U	0.010 U	0.010 U
Lead	8.5	23.8	58.8	213.0
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0005 J
Selenium	1.000 U	2.000 U	0.500 U	1.000 U
Silver	0.050 U	0.100 U	0.005 U	0.050 U

4.1.3 Baghouse Dust

Analytical results of baghouse dust samples for RCRA TCLP metals are presented in Table 4.1.3. All baghouse dust samples were above the TCLP regulatory limit for lead (5 mg/L) and cadmium (1 mg/L).

The TCLP lead concentrations range from 835 mg/L for the No. 1 Baghouse (BD-001) to 27.4 mg/L for the No. 2 Baghouse/Roof Baghouse (BD-002). The Primary Baghouse of the Slag Granulation Plant (BD-003) and the Secondary Baghouse of the Slag Granulation Plant (BD-004) have TCLP lead concentrations of 89.5 mg/L and 48.3 mg/L, respectively.

The TCLP cadmium concentrations range from 56.0 mg/L for the Secondary Baghouse of the Slag Granulation Plant (BD-004) to 7.97 mg/L for the Primary Baghouse of the Slag Granulation Plant (BD-003). The No. 1 Baghouse (BD-001) and the No. 2 Baghouse/Roof Baghouse (BD-002) have TCLP cadmium concentrations of 36.9 mg/L and 54 mg/L, respectively.

No baghouse dust samples were above the TCLP regulatory limits for arsenic, barium, chromium, mercury, selenium, or silver. No significant differences between the baghouse dust samples were noted with regard to arsenic, barium, chromium, mercury, selenium, or silver.

Table 4.1.3
Baghouse Dust
TCLP Metal Concentrations
(mg/L)

No split taken

RCRA Metal	BD-001	BD-002	BD-003	BD-004
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U
Barium	0.2	0.1	0.3	0.1
Cadmium	36.90	54.00	7.97	56.00
Chromium	0.010 U	0.037	0.010 U	0.010 U
Lead	835	27.4	89.5	48.3
Mercury	0.0006 J	0.11 J	0.0016 J	0.0002 J
Selenium	2.000 U	10.00	0.800 U	0.600 U
Silver	0.100 U	0.500 U	0.005 U	0.005 U

4.1.4 Spent Refractory Brick

Analytical results of spent refractory brick samples for RCRA TCLP metals are presented in Table 4.1.4. Two brick samples (RB-001 and RB-006) are above the TCLP regulatory limit for both lead (5 mg/L) and cadmium (1/mg/L). All other brick samples are below the TCLP regulatory limits for all RCRA metals.

Brick sample RB-006, with high TCLP lead (6.7 mg/L) and cadmium (1.35 mg/L), represents a composite sample of three areas of brick pieces and associated brick pile material. The material composited for RB-006 represented a visibly significant portion of the spent refractory brick pile (Photos 36, 37). ?

Table 4.1.4
Spent Refractory Brick
TCLP Metal Concentrations
(mg/L)

split taken
not
split analyzed

RCRA Metal	RB-001	RB-002	RB-003	RB-004	RB-005	RB-006
Arsenic	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Barium	1.0	0.2	0.2	0.5	0.2	1.2
Cadmium	2.21	0.005 U	0.005 U	0.005 U	0.005 U	1.35
Chromium	0.066	0.010 U	2.020	0.010 U	0.852	0.010 U
Lead	33.0	0.1	0.050 U	0.050 U	0.050 U	6.7
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ
Selenium	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Silver	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

Red Coote



P.O. BOX 187 • ALTON, ILLINOIS 62002

CHAIN OF CUSTODY RECORD

TODAY'S DATE:

6/1/98

SAMPLES SENT TO:

EA Inc

PROJECT NO.		PROJECT NAME		NO. OF CONTAINERS	REMARKS						
USEPA Sampling, Split (5/28-5/29)		SAMPLERS: (Signature)									
Tech Law											
STATION NO.	DATE	TIME	COMP. GRAB	STATION LOCATION							
SD-1	5/28		X	South of Truck lot	1						
SD-2	5/28		X	" " " "	1						
*SS-001	5/28		X	Truck lot	1						
SS-101	5/28		X	Truck lot " " Dip	1						
*SS-002	5/28		X	Soil Sample Truck Lot	1						
*SS-003	5/28		X	Not Area #1, E of Truck Lot	1						
*SS-004	5/28		X	" " " "	1						
*SS-005	5/28		X	Former Ref. Brick in Truck lot	1						
*SS-006	5/28		X	" " " "	1						
*SS-007	5/28		X	" " " "	1						
*SS-008	5/28		X	" " " "	1						
SW-3	5/28		X	W Side Edam - Remott	1						
SW-4	5/29		X	E side Edam, Remott	1						
SW-5	5/28		X	E side Edam, Remott	1						
Beg-1	5/28		X	" " " "	1						
Beg-2	5/28		X	at house near lot Drive	1						
Beg-3	5/29		X	" " " "	1						
RELINQUISHED BY: (Signature)					DATE	TIME	RECEIVED BY:	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY:
RELINQUISHED BY: (Signature)					DATE	TIME	RECEIVED BY:	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY:
RELINQUISHED BY: (Signature)					DATE	TIME	RECEIVED BY:	DATE	TIME	REMARKS	

Total - RCRA Metals 6/1/98
 - Use for MS/MSD, FD for Soil
 Preserved w/ HNO₃ to pH < 2
 If sample exhibits a RCRA Total Metal CC > 20 times the regulatory limit for RCRA TMLP Metal CC, please analyze for TMLP

DISTRIBUTION: Original to Lab, Copy 1 to Field Files, Copy 2 to Project Manager

Chemetco
P.O. Box 187
Alton, IL 62002

1265 Capital Airport Drive
Springfield, IL 62707-8413

Phone: 217-753-1148
FAX: 217-753-1152

Client Project: **USEPA Split-Brick**
Date Received: 20-Jan-99

PAS Project Code: CSD-310
Date Reported: 26-Jan-99

Sample Description:	RB-001-A	RB-001-B	----	----	----
PAS Sample Number:	9901200240	9901200241	----	----	----
Date Sampled:	29-May-98	29-May-98	----	----	----
Date Analyzed:	26-Jan-99	26-Jan-99	----	----	----


TCLP Element(s) Analysis - ICP

<u>Element(s)</u>	RL mg/l	Result mg/l	Result mg/l	Result mg/l	Regulatory Limit mg/l	STORET Number	EPA Method
Cadmium, TCLP	0.004	5.10	3.23	-----	1.00	99016	6010B
Lead, TCLP	0.040	115	25.3	-----	5.00	99020	6010B

Element(s) Analysis - ICP

<u>Element(s)</u>	RL mg/kg	Result mg/kg	Result mg/kg	Result mg/kg	Result mg/kg	Result mg/kg	EPA Method
Copper, Total	0.05	1269	54.5	-----	-----	-----	6010B
Tin, Total	0.05	304	42.5	-----	-----	-----	6010B
Lead, Total	0.05	2825	1127	-----	-----	-----	6010B

****CONFIDENTIAL & PRIVELEGED****
Prepared in Anticipation of Litigation


Stephen R. Johnson, Laboratory Director

CONFIDENTIAL & PRIVELEGED - WORK PRODUCT IN ANTICIPATION OF LITIGATION

Refractory Brick sample RB-001 which was taken as a split sample during USEPA's visit in May. Opposite quarters were split between USEPA and Chemetco. Chemetco's quarters were analyzed separately as seen below (RB-001-A and RB-001-B). It is unclear as to how or if USEPA combined their quarters.

	Chemetco RB-001-A	Chemetco RB-001-B	Average of Chemetco's RB-001-A and RB-001-B	USEPA RB-001
Cd, TCLP (mg/l)	5.10	3.23	4.17	2.21
Pb, TCLP (mg/L)	115	25.3	70.15	33.0
Total Copper (mg/kg)	1269	54.5	661.75	
Total Tin (mg/kg)	304	42.5	173.25	
Total Lead (mg/kg)	2825	1127	1976.00	

RB-001-A = 1 quarter section of brick

RB-001-B = 1 quarter section of brick

Average (Column 4) = (RB-001-A + RB-001-B)/2

Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 1
REPORT NO.: 74103
DATE : 07/06/98
P.O. NO.:

REPORT OF ANALYSIS

SUBJECT: Analysis of waste samples in accordance with SW-846: Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, 3rd Edition, 1986; where applicable.

Analysis of water and soil samples for metals as requested by Ms. Heather Young.

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930405	SW-1 Water SAMPLE DATE: 05/28/98				
	Total Metals Prep/Flame AA	06/02/98		3010	
	Total Metals Prep/GTF AA	06/02/98		3020	
	Total Metals Prep/ICP	06/02/98		3010	
	Total Metals Prep/As,Se	06/02/98		7060	
	Silver	< 0.005	mg Ag/l	7760	
	Arsenic	0.006	mg As/l	7060	
	Barium	0.080	mg Ba/l	6010	
	Cadmium	0.015	mg Cd/l	6010	
	Chromium	< 0.010	mg Cr/l	6010	
	Mercury	< 0.0002	mg Hg/l	7470	
	Lead	0.067	mg Pb/l	7421	
	Selenium	0.005	mg Se/l	7740	
1930406	SW-2 Water SAMPLE DATE: 05/28/98				
	Total Metals Prep/Flame AA	06/02/98		3010	
	Total Metals Prep/GTF AA	06/02/98		3020	
	Total Metals Prep/ICP	06/02/98		3010	
	Total Metals Prep/As,Se	06/02/98		7060	
	Silver	< 0.005	mg Ag/l	7760	
	Arsenic	< 0.005	mg As/l	7060	
	Barium	0.080	mg Ba/l	6010	
	Cadmium	0.008	mg Cd/l	6010	



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 2
REPORT NO.: 74103
DATE: 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930406	SW-2 Water (CONTINUED)				
	Chromium	< 0.010	mg Cr/l	6010	
	Mercury	< 0.0002	mg Hg/l	7470	
	Lead	0.027	mg Pb/l	7421	
	Selenium	0.006	mg Se/l	7740	
1930407	SW-6 Water SAMPLE DATE: 05/29/98				
	Total Metals Prep/Flame AA	06/02/98		3010	
	Total Metals Prep/GTF AA	06/02/98		3020	
	Total Metals Prep/ICP	06/02/98		3010	
	Total Metals Prep/As,Se	06/02/98		7060	
	Silver	0.021	mg Ag/l	7760	
	Arsenic	0.084	mg As/l	7060	
	Barium	1.16	mg Ba/l	6010	
	Cadmium	0.128	mg Cd/l	6010	
	Chromium	0.043	mg Cr/l	6010	
	Mercury	0.0040	mg Hg/l	7470	
	Lead	4.81	mg Pb/l	7421	
	Selenium	< 0.125	mg Se/l	7740	
1930408	SW-8 Water SAMPLE DATE: 05/28/98				
	Total Metals Prep/Flame AA	06/02/98		3010	
	Total Metals Prep/GTF AA	06/02/98		3020	
	Total Metals Prep/ICP	06/02/98		3010	
	Total Metals Prep/As,Se	06/02/98		7060	
	Silver	0.026	mg Ag/l	7760	
	Arsenic	0.235	mg As/l	7060	
	Barium	1.00	mg Ba/l	6010	
	Cadmium	0.036	mg Cd/l	6010	
	Chromium	0.140	mg Cr/l	6010	



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 3
REPORT NO.: 74103
DATE: 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930408	SW-8 Water (CONTINUED)				
	Mercury	0.0062	mg Hg/l	7470	
	Lead	11.3	mg Pb/l	7421	
	Selenium	< 0.5	mg Se/l	7740	
1930409	SD-3 Soil SAMPLE DATE: 05/28/98				
	Silver	0.53	µg Ag/g	7760	
	Arsenic	2.79	µg As/g	7060	
	Barium	168	µg Ba/g	6010	
	Cadmium	54.9	µg Cd/g	6010	
	Chromium	20.9	µg Cr/g	6010	
	Mercury	0.11	µg Hg/g	7470	
	Lead	405	µg Pb/g	6010	
	Selenium	1.48	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930410	SD-4 Soil SAMPLE DATE: 05/29/98				
	Silver	0.53	µg Ag/g	7760	
	Arsenic	3.97	µg As/g	7060	
	Barium	124	µg Ba/g	6010	
	Cadmium	1.51	µg Cd/g	6010	
	Chromium	19.0	µg Cr/g	6010	
	Mercury	0.020	µg Hg/g	7470	
	Lead	151	µg Pb/g	6010	
	Selenium	0.19	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930411	SD-5 Soil SAMPLE DATE: 05/29/98				



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 4
REPORT NO.: 74103
DATE: 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930411	SD-5 Soil (CONTINUED)				
	Silver	0.56	µg Ag/g	7760	
	Arsenic	3.92	µg As/g	7060	
	Barium	135	µg Ba/g	6010	
	Cadmium	0.91	µg Cd/g	6010	
	Chromium	18.9	µg Cr/g	6010	
	Mercury	0.033	µg Hg/g	7470	
	Lead	186	µg Pb/g	6010	
	Selenium	0.34	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930412	SD-8 Soil SAMPLE DATE: 05/28/98				
	Silver	0.50	µg Ag/g	7760	
	Arsenic	5.63	µg As/g	7060	
	Barium	253	µg Ba/g	6010	
	Cadmium	2.16	µg Cd/g	6010	
	Chromium	44.7	µg Cr/g	6010	
	Mercury	0.059	µg Hg/g	7470	
	Lead	1532	µg Pb/g	6010	
	Selenium	0.60	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930413	SS-009 Soil SAMPLE DATE: 05/28/98				
	Silver	0.62	µg Ag/g	7760	
	Arsenic	12.3	µg As/g	7060	
	Barium	257	µg Ba/g	6010	
	Cadmium	14.4	µg Cd/g	6010	
	Chromium	21.1	µg Cr/g	6010	
	Mercury	0.12	µg Hg/g	7470	
	Lead	880	µg Pb/g	6010	



Environmental Analysis, Inc.

3278 North Hwy. 87 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 5
REPORT NO.: 74103
DATE : 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930413	SS-009 Soil (CONTINUED)				
	Selenium	0.56	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930414	SS-010 Soil SAMPLE DATE: 05/28/98				
	Silver	0.52	µg Ag/g	7760	
	Arsenic	8.31	µg As/g	7060	
	Barium	283	µg Ba/g	6010	
	Cadmium	9.02	µg Cd/g	6010	
	Chromium	26.0	µg Cr/g	6010	
	Mercury	0.081	µg Hg/g	7470	
	Lead	872	µg Pb/g	6010	
	Selenium	1.11	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930415	SS-011 Soil SAMPLE DATE: 05/28/98				
	Silver	0.62	µg Ag/g	7760	
	Arsenic	5.66	µg As/g	7060	
	Barium	256	µg Ba/g	6010	
	Cadmium	1.60	µg Cd/g	6010	
	Chromium	23.1	µg Cr/g	6010	
	Mercury	0.051	µg Hg/g	7470	
	Lead	388	µg Pb/g	6010	
	Selenium	0.19	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930416	SS-012 Soil SAMPLE DATE: 05/28/98				
	Silver	0.50	µg Ag/g	7760	



Environmental Analysis, Inc.

3278 North Hwy. 87 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 6
REPORT NO.: 74103
DATE: 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930416	SS-012 Soil (CONTINUED)				
	Arsenic	4.67	µg As/g	7060	
	Barium	261	µg Ba/g	6010	
	Cadmium	0.54	µg Cd/g	6010	
	Chromium	19.9	µg Cr/g	6010	
	Mercury	0.040	µg Hg/g	7470	
	Lead	167	µg Pb/g	6010	
	Selenium	0.44	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930417	SS-013 Soil SAMPLE DATE: 05/28/98				
	Silver	0.44	µg Ag/g	7760	
	Arsenic	3.57	µg As/g	7060	
	Barium	251	µg Ba/g	6010	
	Cadmium	< 0.04	µg Cd/g	6010	
	Chromium	19.6	µg Cr/g	6010	
	Mercury	0.034	µg Hg/g	7470	
	Lead	121	µg Pb/g	6010	
	Selenium	0.23	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930418	SD-007 Soil SAMPLE DATE: 05/28/98				
	Silver	0.59	µg Ag/g	7760	
	Arsenic	6.33	µg As/g	7060	
	Barium	134	µg Ba/g	6010	
	Cadmium	1390	µg Cd/g	6010	
	Chromium	100	µg Cr/g	6010	
	Mercury	39.3	µg Hg/g	7470	
	Lead	2.17	% Pb w/w	6010	
	Selenium	0.18	µg Se/g	7740	



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 7
REPORT NO.: 74103
DATE: 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930418	SD-007 Soil (CONTINUED)				
	Total Metals Prep for solids	1		3050	
1930419	SD-006 Soil SAMPLE DATE: 05/29/98				
	Silver	0.54	µg Ag/g	7760	
	Arsenic	3.33	µg As/g	7060	
	Barium	150	µg Ba/g	6010	
	Cadmium	< 0.04	µg Cd/g	6010	
	Chromium	20.9	µg Cr/g	6010	
	Mercury	0.014	µg Hg/g	7470	
	Lead	26.4	µg Pb/g	6010	
	Selenium	< 0.5	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930420	SD-1 Soil SAMPLE DATE: 05/28/98				
	Silver	0.48	µg Ag/g	7760	
	Arsenic	2.67	µg As/g	7060	
	Barium	127	µg Ba/g	6010	
	Cadmium	208	µg Cd/g	6010	
	Chromium	16.8	µg Cr/g	6010	
	Mercury	0.18	µg Hg/g	7470	
	Lead	410	µg Pb/g	6010	
	Selenium	5.86	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930421	SD-2 Soil SAMPLE DATE: 05/28/98				
	Silver	0.40	µg Ag/g	7760	
	Arsenic	2.72	µg As/g	7060	



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 8
REPORT NO.: 74103
DATE : 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930421	SD-2 Soil (CONTINUED)				
	Barium	107	µg Ba/g	6010	
	Cadmium	81.4	µg Cd/g	6010	
	Chromium	11.3	µg Cr/g	6010	
	Mercury	0.061	µg Hg/g	7470	
	Lead	104	µg Pb/g	6010	
	Selenium	1.12	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930422	SS-001 Soil SAMPLE DATE: 05/28/98				
	Silver	1.8	µg Ag/g	7760	
	Arsenic	9.49	µg As/g	7060	
	Barium	369	µg Ba/g	6010	
	Cadmium	74.3	µg Cd/g	6010	
	Chromium	44.5	µg Cr/g	6010	
	Mercury	0.29	µg Hg/g	7470	
	Lead	4170	µg Pb/g	6010	
	Selenium	< 1	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930423	SS-101 Soil SAMPLE DATE: 05/28/98				
	Silver	2.1	µg Ag/g	7760	
	Arsenic	9.17	µg As/g	7060	
	Barium	330	µg Ba/g	6010	
	Cadmium	41.7	µg Cd/g	6010	
	Chromium	34.6	µg Cr/g	6010	
	Mercury	0.15	µg Hg/g	7470	
	Lead	3740	µg Pb/g	6010	
	Selenium	0.74	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	



Environmental Analysis, Inc.

3278 North Hwy. 87 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 9
REPORT NO.: 74103
DATE: 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930424	SS-002 Soil SAMPLE DATE: 05/28/98				
	Silver	1.2	µg Ag/g	7760	
	Arsenic	1.04	µg As/g	7060	
	Barium	335	µg Ba/g	6010	
	Cadmium	18.6	µg Cd/g	6010	
	Chromium	18.4	µg Cr/g	6010	
	Mercury	0.06	µg Hg/g	7470	
	Lead	2340	µg Pb/g	6010	
	Selenium	< 1	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930425	SS-003 Soil SAMPLE DATE: 05/28/98				
	Silver	2.2	µg Ag/g	7760	
	Arsenic	2.84	µg As/g	7060	
	Barium	277	µg Ba/g	6010	
	Cadmium	16.7	µg Cd/g	6010	
	Chromium	99.7	µg Cr/g	6010	
	Mercury	0.15	µg Hg/g	7470	
	Lead	4340	µg Pb/g	6010	
	Selenium	0.61	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930426	SS-004 Soil SAMPLE DATE: 05/28/98				
	Silver	1.8	µg Ag/g	7760	
	Arsenic	6.17	µg As/g	7060	
	Barium	206	µg Ba/g	6010	
	Cadmium	37.1	µg Cd/g	6010	
	Chromium	85.5	µg Cr/g	6010	
	Mercury	0.08	µg Hg/g	7470	



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 10
REPORT NO.: 74103
DATE: 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930426	SS-004 Soil (CONTINUED)				
	Lead	4230	µg Pb/g	6010	
	Selenium	0.84	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930427	SS-005 Soil SAMPLE DATE: 05/28/98				
	Silver	1.3	µg Ag/g	7760	
	Arsenic	4.99	µg As/g	7060	
	Barium	180	µg Ba/g	6010	
	Cadmium	1.48	µg Cd/g	6010	
	Chromium	21.7	µg Cr/g	6010	
	Mercury	0.04	µg Hg/g	7470	
	Lead	1380	µg Pb/g	6010	
	Selenium	< 0.5	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930428	SS-006 Soil SAMPLE DATE: 05/28/98				
	Silver	0.84	µg Ag/g	7760	
	Arsenic	3.84	µg As/g	7060	
	Barium	230	µg Ba/g	6010	
	Cadmium	34.3	µg Cd/g	6010	
	Chromium	28.2	µg Cr/g	6010	
	Mercury	0.03	µg Hg/g	7470	
	Lead	2370	µg Pb/g	6010	
	Selenium	0.59	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930429	SS-007 Soil SAMPLE DATE: 05/28/98				



Environmental Analysis, Inc.

3278 North Hwy. 87 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 11
REPORT NO.: 74103
DATE : 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930429	SS-007 Soil (CONTINUED)				
	Silver	0.60	µg Ag/g	7760	
	Arsenic	20.9	µg As/g	7060	
	Barium	240	µg Ba/g	6010	
	Cadmium	29.3	µg Cd/g	6010	
	Chromium	25.4	µg Cr/g	6010	
	Mercury	0.08	µg Hg/g	7470	
	Lead	2780	µg Pb/g	6010	
	Selenium	1.03	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930430	SS-008 Soil SAMPLE DATE: 05/28/98				
	Silver	0.71	µg Ag/g	7760	
	Arsenic	6.78	µg As/g	7060	
	Barium	288	µg Ba/g	6010	
	Cadmium	67.7	µg Cd/g	6010	
	Chromium	27.2	µg Cr/g	6010	
	Mercury	0.19	µg Hg/g	7470	
	Lead	4510	µg Pb/g	6010	
	Selenium	0.68	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
1930431	SW-3 Water SAMPLE DATE: 05/29/98				
	Total Metals Prep/Flame AA	06/02/98		3010	
	Total Metals Prep/GTF AA	06/02/98		3020	
	Total Metals Prep/ICP	06/02/98		3010	
	Total Metals Prep/As,Se	06/02/98		7060	
	Silver	< 0.005	mg Ag/l	7760	
	Arsenic	0.011	mg As/l	7060	
	Barium	0.106	mg Ba/l	6010	



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 12
REPORT NO.: 74103
DATE : 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930431	SW-3 Water (CONTINUED)				
	Cadmium	0.018	mg Cd/l	6010	
	Chromium	< 0.010	mg Cr/l	6010	
	Mercury	< 0.0002	mg Hg/l	7470	
	Lead	0.086	mg Pb/l	7421	
	Selenium	< 0.005	mg Se/l	7740	
1930432	SW-4 Water SAMPLE DATE: 05/29/98				
	Total Metals Prep/Flame AA	06/02/98		3010	
	Total Metals Prep/GTF AA	06/02/98		3020	
	Total Metals Prep/ICP	06/02/98		3010	
	Total Metals Prep/As,Se	06/02/98		7060	
	Silver	0.011	mg Ag/l	7760	
	Arsenic	0.025	mg As/l	7060	
	Barium	0.622	mg Ba/l	6010	
	Cadmium	0.245	mg Cd/l	6010	
	Chromium	0.032	mg Cr/l	6010	
	Mercury	0.0014	mg Hg/l	7470	
	Lead	5.02	mg Pb/l	7421	
	Selenium	< 0.05	mg Se/l	7740	
1930433	SW-5 Water SAMPLE DATE: 05/28/98				
	Total Metals Prep/Flame AA	06/02/98		3010	
	Total Metals Prep/GTF AA	06/02/98		3020	
	Total Metals Prep/ICP	06/02/98		3010	
	Total Metals Prep/As,Se	06/02/98		7060	
	Silver	< 0.005	mg Ag/l	7760	
	Arsenic	0.008	mg As/l	7060	
	Barium	0.152	mg Ba/l	6010	
	Cadmium	0.055	mg Cd/l	6010	



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 13
REPORT NO.: 74103
DATE : 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
1930433	SW-5 Water (CONTINUED)				
	Chromium	< 0.010	mg Cr/l	6010	
	Mercury	< 0.0002	mg Hg/l	7470	
	Lead	0.565	mg Pb/l	7421	
	Selenium	< 0.05	mg Se/l	7740	
1930434	Bkg-1 Soil SAMPLE DATE: 05/28/98				
	Silver	0.59	µg Ag/g	7760	
	Arsenic	2.58	µg As/g	7060	
	Barium	156	µg Ba/g	6010	
	Cadmium	< 0.1	µg Cd/g	6010	
	Chromium	22.9	µg Cr/g	6010	
	Mercury	0.02	µg Hg/g	7470	
	Lead	64.6	µg Pb/g	6010	
	Selenium	< 0.5	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
2000101	Bkg-2 Soil SAMPLE DATE: 05/29/98				
	Silver	0.61	µg Ag/g	7760	
	Arsenic	3.61	µg As/g	7060	
	Barium	208	µg Ba/g	6010	
	Cadmium	< 0.1	µg Cd/g	6010	
	Chromium	27.8	µg Cr/g	6010	
	Mercury	0.03	µg Hg/g	7470	
	Lead	22.3	µg Pb/g	6010	
	Selenium	0.75	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
2000102	Bkg-2 Soil SAMPLE DATE: 05/29/98				



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO, INC.
P.O. Box 67
Hartford, IL 62048-0067

PAGE NO.: 14
REPORT NO.: 74103
DATE: 07/06/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
2000102	Bkg-2 Soil (CONTINUED)				
	Silver	0.54	µg Ag/g	7760	
	Arsenic	3.31	µg As/g	7060	
	Barium	186	µg Ba/g	6010	
	Cadmium	< 0.1	µg Cd/g	6010	
	Chromium	23.5	µg Cr/g	6010	
	Mercury	0.03	µg Hg/g	7470	
	Lead	27.7	µg Pb/g	6010	
	Selenium	0.56	µg Se/g	7740	
	Total Metals Prep for solids	1		3050	
2000103	SW-007 Water SAMPLE DATE: 05/28/98				
	Total Metals Prep/Flame AA	06/02/98		3010	
	Total Metals Prep/GTF AA	06/02/98		3020	
	Total Metals Prep/ICP	06/02/98		3010	
	Total Metals Prep/As,Se	06/02/98		7060	
	Silver	0.030	mg Ag/l	7760	
	Arsenic	0.173	mg As/l	7060	
	Barium	0.064	mg Ba/l	6010	
	Cadmium	0.416	mg Cd/l	6010	
	Chromium	0.014	mg Cr/l	6010	
	Mercury	0.0075	mg Hg/l	7470	
	Lead	0.084	mg Pb/l	7421	
	Selenium	< 0.5	mg Se/l	7740	

RESPECTFULLY SUBMITTED

R. A. FERRIS



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO
P.O. Box 67
Hartford, IL 62048

PAGE NO.: 1
REPORT NO.: 74206
DATE : 07/15/98
P.O. NO.:

REPORT OF ANALYSIS

SUBJECT: Analysis of waste samples in accordance with SW-846: Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, 3rd Edition, 1986; where applicable.

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
2001905	SS-009 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Lead	1.21	mg Pb/l	7421	
2001906	SS-010 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Lead	0.69	mg Pb/l	7421	
2001907	SS-011 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Lead	0.43	mg Pb/l	7421	
2001908	SS-012 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Lead	0.13	mg Pb/l	7421	
2001909	SS-013 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Lead	< 0.1	mg Pb/l	7421	



Environmental Analysis, Inc.

3278 North Hwy. 87 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO
P.O. Box 67
Hartford, IL 62048

PAGE NO.: 2
REPORT NO.: 74206
DATE : 07/15/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
2001910	SS-001 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Cadmium	1.58	mg Cd/l	6010	
	TCLP Lead	31.5	mg Pb/l	7421	
2001911	SS-002 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Lead	20.4	mg Pb/l	7421	
2001912	SS-003 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Lead	26.8	mg Pb/l	7421	
2001913	SS-004 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Cadmium	1.99	mg Cd/l	6010	
	TCLP Lead	29.2	mg Pb/l	7421	
2001914	SS-005 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Lead	4.1	mg Pb/l	7421	
2001915	SS-006 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	



Environmental Analysis, Inc.

3278 North Hwy. 67 • Florissant, MO 63033 • 314-921-4488



Mr. Greg Cotter
CHEMETCO
P.O. Box 67
Hartford, IL 62048

PAGE NO.: 3
REPORT NO.: 74206
DATE : 07/15/98
P.O. NO.:

LOG NUMBER	SAMPLE DESCRIPTION	RESULTS OF ANALYSIS	UNITS OF MEASURE	METHOD NUMBER	NOTE
2001915	SS-006 Soil (CONTINUED)				
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Cadmium	0.45	mg Cd/l	6010	
	TCLP Lead	17.7	mg Pb/l	7421	
2001916	SS-007 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Cadmium	0.87	mg Cd/l	6010	
	TCLP Lead	13.6	mg Pb/l	7421	
2001917	SS-008 Soil				
	TCLP Metals Prep/ICP	07/06/98		3010	
	TC Leaching Proc.	Vol.55,#61	Fed.Reg.	1311	
	TCLP Cadmium	0.89	mg Cd/l	6010	
	TCLP Lead	57.9	mg Pb/l	7421	

RESPECTFULLY SUBMITTED

R. M. FERRIS



DRAFT

**CHEMETCO, INC.
HARTFORD, ILLINOIS
EPA ID NO. ILD048843809**

**SITE-SPECIFIC SAMPLING AND ANALYSIS PLAN
WASTE, SOIL, SURFACE WATER,
AND SEDIMENT SAMPLING**

The following constitutes the Site-Specific Field Sampling and Analysis Plan (SAP) for waste, soil, surface water and sediment sampling to be performed by TechLaw at the Chemetco, Inc. (Chemetco) facility in Hartford, Illinois. It is anticipated that sampling activities will be undertaken May 28 and 29, 1998. The TechLaw sampling activities will utilize a three person Sampling Team in addition to the U.S. EPA Technical Lead, Mr. Patrick Kuefler, and a representative of the Illinois EPA (IEPA), Mr. Chris Cahnovsky.

This SAP will be used in conjunction with TechLaw's U.S. EPA-approved Region 5 Generic Quality Assurance Project Plan (QAPP) for Sampling Operations, dated January 1995. TechLaw has selected QST Environmental Laboratory (Gainesville, Florida), a TechLaw Team Subcontractor, to perform the analyses required under this SAP.

Purpose and Objective

This SAP has been prepared to allow for the collection and analysis of solid waste streams, soil, surface water and sediment samples at the Chemetco facility. These samples will be collected in support of U.S. EPA Region 5's ongoing enforcement case development activities for this site. These activities relate to the potential improper identification of solid and hazardous waste streams and potential releases of hazardous constituents from the Chemetco facility. A summary of the sampling effort is presented in Table 1, including the identification of sample numbers and Quality Assurance/Quality Control (QA/QC) samples. A summary of analytical methods is presented in Table 2, including recommended sample containers, holding times, and preservatives related to the sampling.

Site Description

The Chemetco facility is located at the intersection of Illinois Route 3 and Oldenberg Road in Madison County, Illinois (Figure 1). The facility is located in a primarily agricultural and light-industrial area. Chemetco operations are conducted on an approximately 40-acre parcel of land surrounded by a chain link fence (Figure 2). Chemetco owns an additional 230 acres of land in the vicinity of the facility.

DRAFT

The Chemetco facility was constructed in 1969 and initiated operations as a copper smelter in 1970 to derive copper and other non-ferrous metals and alloys from recyclable copper bearing scrap and manufacturing residues. The Chemetco facility produces anode copper, cathode copper, and crude lead-tin solder.

The Chemetco facility is located in the floodplain of the Mississippi River in an area locally referred to as the American Bottoms. This area is characterized by relatively flat topography which produces minimal runoff. Precipitation either infiltrates to groundwater or evaporates as the surface gradient of the facility property has been estimated at only 12 inches per mile.

Solid Waste Streams

File material and information obtained from the IEPA has identified four solid waste streams requiring characterization at the Chemetco facility. These waste streams are:

- Waste Slag;
- Baghouse Dust;
- Zinc Oxide; and,
- Spent Refractory Brick.

lead & tin
reclaimed
no longer utilized

Consistent viscosity drop temp of furnace

Waste slag is generated from both water-cooled and air-cooled processes in the Slag Drying and Screening Building. Slag is screened and subsequently stored into five separate slag piles identified as Units (Figure 2).

no longer done

A total of four baghouses are utilized at the facility to control air emissions, including one baghouse associated directly with the Slag Drying and Screening Operation, one baghouse associated with the Slag Grinding Operations, and a roof baghouse on the Slag Drying and Screening Operation Building. Information obtained from the IEPA indicates that significant volumes of baghouse dust accumulates on concrete and/or asphalt surfaces outside of the Slag Drying and Screening Operation Building. In addition, the IEPA has indicated that baghouse dust has been stored on-site at the Chemetco facility in the slag pile Units (Figure 2).

is cleaned

Dave -

Where is figure 2

Process wastewater generated from a venturi scrubber system is currently discharged to an open concrete tank for settling solids which are subsequently de-watered in a zinc oxide filter press. The filter cake from the press is described in file material as zinc oxide. In the past, process wastewater was routed to lagoons for settling and subsequent filter press de-watering. The resulting material was store on-site in a zinc oxide pile. This zinc oxide pile was later converted to a Zinc Oxide Bunker, and is still used for zinc oxide storage in current facility operations. File material indicates that the Zinc Oxide Bunker is located in the vicinity of slag Unit 1 (Figure 2).

nothing new has been added

Spent refractory brick is generated from the smelting operations and is stored on-site.

Information obtained from the IEPA indicates that the facility is currently storing a significant volume of spent refractory brick on the south side of the Zinc Oxide Bunker. To process spent

DRAFT

do not!

refractory brick, the facility currently operates an IEPA-air permitted rock crusher. This crusher generates residual brick "fines" and wastewater from air emission control.

brick has not been crushed

Waste Sampling

The goal of the waste sampling effort is to obtain representative samples of the solid waste streams. A summary the waste sampling effort is presented in Table 1, while analytical methods for the waste samples are presented in Table 2.

To characterize the waste slag generated at the facility, samples will be collected from the slag pile Units, the slag accumulation areas associated with the Slag Screening Operation, and the slag "fines" discharged from the Slag Drying and Screening Operation. When sampling the slag pile Units, an attempt will be made to sample various sizes of slag pieces. In addition, information obtained from the IEPA indicates that sampling various sizes of slag may need to be undertaken beneath the Screening Operation conveyors where slag has been segregated. Overall, the determination of sample location within the slag pile Units and in the slag processing areas will be based on field conditions and will be undertaken following the direction of the U.S. EPA Technical Lead.

Air cooled already sampled - 1988 (EP Tox.)

It is anticipated that all slag samples will be collected using hand augering techniques. However, the sampling of the slag pile Units may require the use of heavy equipment to assist with the vertical characterization. It is anticipated that a minimum of five samples will be collected from each slag pile Unit and a minimum of three samples will be taken in each slag processing area. It is expected that up to a total of approximately 50 samples will be taken for the entire slag sampling effort. All slag samples will be analyzed to determine if the samples exhibit the toxicity characteristics for RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) using the Toxicity Characteristic Leaching Procedure (TCLP).

who is to supply?

Statistical Analysis? if so, not enough samples?

To characterize the dust generated from the four baghouses, a minimum of three samples will be taken from each baghouse. This will include samples taken from the two baghouses associated directly with the Slag Drying and Screening Operation, the baghouse associated with the Slag Grinding Operations, and the roof baghouse on the Slag Drying and Screening Operation Building. In addition, a minimum of three samples will be taken each from the baghouse dust accumulating in the vicinity of the Slag Drying and Screening Operation baghouse and the baghouse dust storage area located in the slag pile Units. All baghouse dust samples will be collected using soil sampling techniques and will be analyzed for RCRA TCLP metals.

To characterize the zinc oxide filter press sludge, a minimum of three samples will be taken from the zinc oxide filter press and a minimum of five samples will be taken from the Zinc Oxide Bunker. In addition, a minimum of five samples will be taken from the zinc oxide product storage area where zinc oxide is accumulated for off-site transport. All zinc oxide samples will be taken using soil sampling techniques and will be analyzed for RCRA TCLP metals.

nothing new, why sampling we already have data

already characterized, we have data

DRAFT

Don't know?

To characterize the spent refractory brick, a minimum of five samples will be taken from the spent refractory brick pile on the south side of the Zinc Oxide Bunker. In addition, a minimum of five samples will be taken from the residual "fines" from the brick crusher and a minimum of two samples will be taken from the wastewater generated from controlling air emissions from the rock crusher. The refractory brick samples and the residual "fines" from the rock crusher will be analyzed for RCRA TCLP metals, while the rock crusher wastewater will be analyzed for total RCRA metals.

Soil Sampling

Lots of concrete!

Soil samples will be collected to determine if there have been releases of hazardous constituents to soil in the refractory brick waste pile area and waste handling areas. A summary of sample numbers and field/analytical parameters is presented in Table 1, and analytical methods for soil samples are presented in Table 2.

Up to a total of five soil samples will be collected in each area using hand augering techniques. All soil samples will be analyzed for RCRA total metals. Any soil sample exhibiting a RCRA total metal concentration greater than 20 times the regulatory limit for RCRA TCLP metals will then be analyzed for RCRA TCLP metals. *Standard procedure?*

Where? Background soil samples will be collected in an undisturbed area in the vicinity of the Chemetco facility to determine natural soil concentrations of RCRA metals. The background soil samples will be collected in an area which does not appear to have been impacted by potential releases from the Chemetco facility. A minimum of five background soil samples will be collected using hand augering techniques and will be analyzed for RCRA total metals.

Surface Water and Sediment Sampling

Remediation not complete. We have data already!

Surface water and co-located sediment samples will be collected to determine if there has been releases of hazardous constituents to Long Lake, which is located south of the operations area of the facility (Figures 1 and 2). Surface water and co-located sediment samples will also be taken in the drainage ditch to the north of Containment Area 4, also located south of the operations area (Figure 2). A summary of sample numbers and field/analytical parameters is presented in Table 1, and analytical methods for the samples are presented in Table 2.

It is anticipated that a minimum of five surface water and co-located sediment samples will be taken. The location of the samples will be based on field conditions and will be selected in coordination with the U.S. EPA Technical Lead.

It is anticipated that surface water samples will be collected by submerging sample containers directly into the surface water. Those areas which are accessible only from a distance will be

**Water before sediment!*

already done

DRAFT

sampled using a pre-cleaned beaker attached to an extendable aluminum pole. The surface water samples will be analyzed for total RCRA metals and field measurements of pH, conductivity, and temperature will also be performed using appropriately calibrated instruments.

Sediment samples will be collected and analyzed for total RCRA metals. Depending upon surface water depth and sediment compactness, sediment samples will be collected as follows:

- Sediment sample locations covered by less than six inches of surface water will be sampled using a pre-cleaned stainless steel trowel or spoon to transfer the sediment material directly into the sample container.
- Sediment sample locations covered by more than six inches of surface water will be sampled using a hand auger with the sample being transferred directly into the sample container or into a stainless steel bowl prior to placement into a sample container; or
- Sediment sample locations covered by more than six inches of surface water not amenable to hand augering will be sampled using a PVC pipe with a vacuum pump or capping device.

Quality Control Samples

During the collection of waste, soil, surface water and sediment samples at the Chemetco facility, the TechLaw Sampling Team will collect a field duplicate for every 10 samples per matrix collected. In addition, equipment blanks will be collected at a frequency of one for every 10 samples per matrix collected. Depending upon the sample collection technique used, equipment blanks will be collected from the surface water sample beaker, hand auger, and PVC sampling pipe. Duplicates and equipment blanks will be analyzed for the same constituents as the associated samples.

One matrix spike/matrix spike duplicate (MS/MSD) sample will be collected for every 20 samples of each matrix collected. These MS/MSD samples will be analyzed for the same constituents as those in the sample matrix being analyzed.

Laboratory quality control requirements are outlined in the TechLaw's U.S. EPA-approved Region 5 Generic QAPP.

Decontamination

Decontamination of sampling equipment will be undertaken according to TechLaw's U.S. EPA-approved Region 5 Generic QAPP for Sampling Operations. Sampling equipment will be decontaminated with a Alconox® soap wash, a potable water rinse, and a de-ionized water rinse. All decontamination solutions will be collected in a five to 55-gallon container/drum, depending upon the expected volume.

DRAFT

Investigation Derived Waste Management

The sampling activities and potential decontamination procedures outlined in this SAP are not expected to generate significant volumes of Investigative Derived Waste (IDW). It is anticipated that the actual environmental sampling will generate little or no IDW, depending upon the sampling procedures ultimately used according to field observations. As the analytical procedures are limited to inorganics, steps will be taken to ensure that only the volume needed for analysis will be collected. In addition, when applicable, media collected for analysis will be placed directly into the sample containers.

The sampling equipment decontamination solutions will be collected in a five to 55-gallon container/drum, depending upon the expected volume, with disposal subsequently arranged at the request of the U.S. EPA Technical Lead. Appropriate analysis of the IDW will be performed and the wastes managed accordingly.

Sample Collection, Preparation, Custody and Shipment

The samples collected by TechLaw will remain in the custody of the TechLaw Sampling Team until shipment to the analytical laboratory. The sample bottles will be appropriately labeled and tagged with U.S. EPA sample tags in accordance with the TechLaw's U.S. EPA-approved Region 5 Generic QAPP.

A chain-of-custody (COC) form will accompany the samples from the point of origin to the analytical laboratory. When the COC is signed by the laboratory, a copy of the COC will be immediately forwarded by TechLaw to the U.S. EPA Technical Lead for subsequent delivery to Chemetco facility representatives.

The samples will be collected in certified-clean sample containers obtained from QST Environmental Laboratory. All samples collected at the Chemetco facility by the TechLaw Sampling Team will be packaged and shipped to QST Environmental Laboratory (Gainesville, Florida) in accordance with the shipping and custody procedures outlined in TechLaw's U.S. EPA-approved Region 5 Generic QAPP.

Analytical Requirements

Analytical and QA/QC requirements, including calibration procedures and frequencies, are outlined in the TechLaw's U.S. EPA-approved Region 5 Generic QAPP. The analytical methods, containers, preservatives, and holding time requirements are presented in Table 2.

DRAFTData Validation

Analytical data will be generated by the subcontractor laboratory and provided to TechLaw in conformance with CLP-like reporting protocols. The resulting data will undergo a 100 percent data validation effort by a member of the TechLaw Team, independent of the sampling team. This validation will be in conformance with the Functional Guidelines for Inorganic Data Validation. Specific data package and data validation requirements are outlined in the U.S. EPA-approved, TechLaw Generic QAPP.

Project Schedule and Report Deliverables

The sampling activities are planned for May 28-29, 1998 with mobilization to the facility occurring on May 27, 1998. A data validation report will be generated within 21 days of receiving the laboratory data package for the final analysis. Within 14 days of the receipt of the data validation report, a final sampling report will be prepared and submitted to the U.S. EPA Work Assignment Manager (EWAM) and the U.S. EPA Technical Lead (Mr. Kuefler). The report will include a discussion and statistical analysis of the results of the sampling effort. In addition, the report will describe the sampling locations and techniques, any problems that were encountered, deviations from this SAP, and any other observations, including photographs, made during the sampling activities.

adequate sampling for stats

Project Organization

The EWAM for this project is Mr. Brian Freeman, and the U.S. EPA Technical Lead is Mr. Kuefler. Mr. Cahnovsky of the IEPA is the State of Illinois representative for the project.

The TechLaw Work Assignment Manager (TWAM) for this project is Ms. Patricia Brown-Derocher, and the TechLaw Technical Lead for this project is Mr. Kevin Higgins. TechLaw field sampling personnel will include Mr. Higgins (Team Leader), Mr. Douglas Updike, and Mr. Michael Powers. Mr. Powers will also serve as TechLaw's Site Safety Officer.

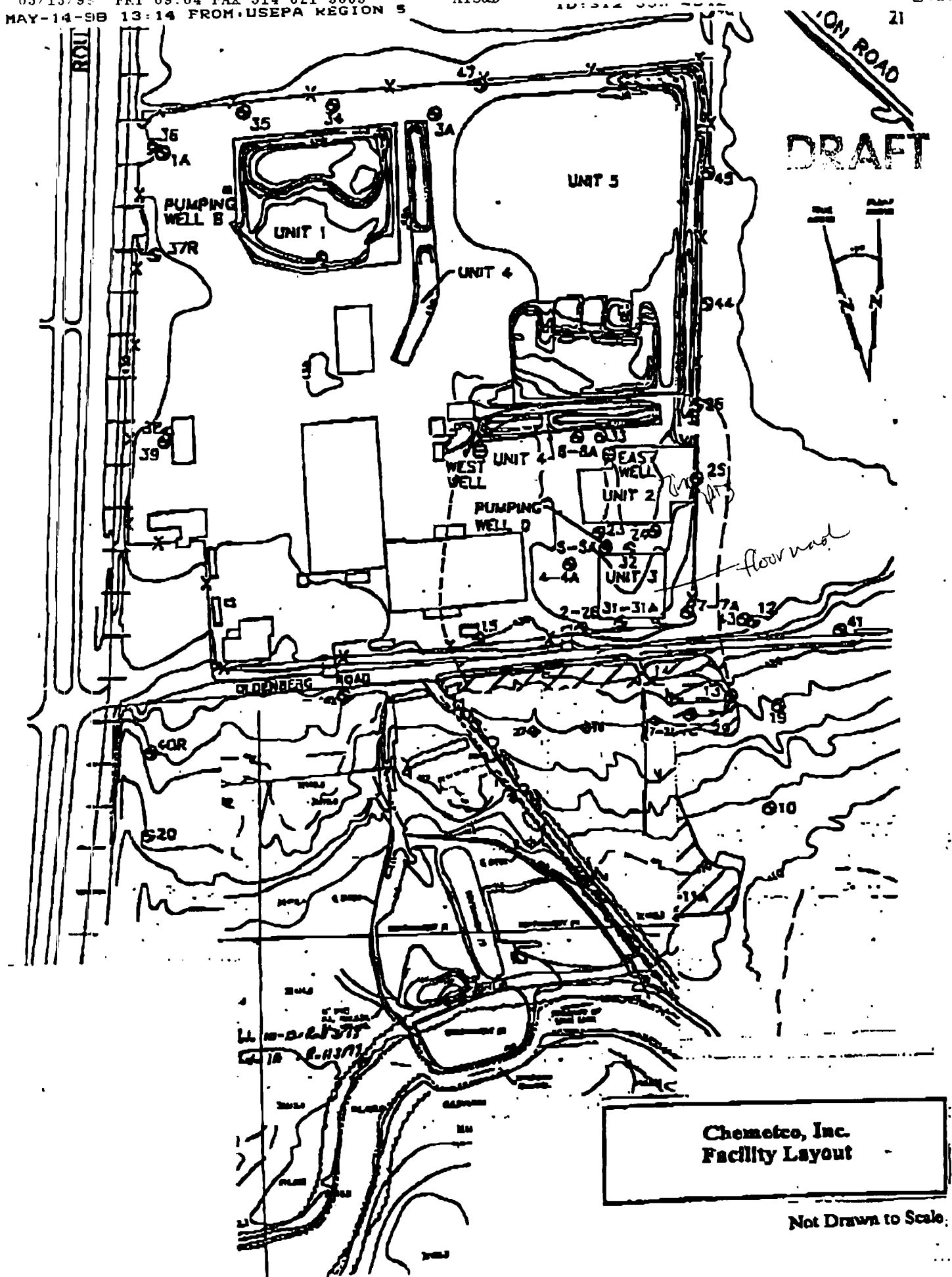
The laboratory for this project is QST Environmental Laboratory (Gainesville, Florida). Data validation will be performed by appropriately qualified members of the TechLaw Team.

DRAFT

FIGURE 1
FACILITY LOCATION

DRAFT

FIGURE 2
FACILITY LAYOUT



Chemetco, Inc.
Facility Layout

Not Drawn to Scale

DRAFT

TABLE 1
SAMPLE COLLECTION SUMMARY

TABLE I
SAMPLE COLLECTION SUMMARY

Waste Stream/Area of Concern		Matrix	Number of Samples	Sample Depth	Field Parameters	Analytical Parameters	Equipment Blanks (EB)	Field Duplicates (FD)	MS/MSDs
Waste Slag		Waste	25 - 30	Based on Field Observations	None	TCLP Metals	3 - 6	3 - 6	2 - 3
Baghouse Dust		Waste	11	Based on Field Observations	None	TCLP Metals	2	2	1
Zinc Oxide	Filter Press	Waste	3	Based on Field Observations	None	TCLP Metals	1 - 2	1 - 2	1
	Bucket	Waste	5						
	Product Storage	Waste	5						
Spent Refractory Brick	Brick Pile	Waste	5	Based on Field Observations	None	TCLP Metals	1	1	1
	Crusher Fines	Waste	3	Based on Field Observations	None	TCLP Metals			
	Crusher Wastewater	Wastewater	2	Based on Field Observations	None	Total RCRA Metals	1	1	1
Refractory Brick Storage Area ?		Soil	5	0 - 6 inches	None	Total RCRA Metals*	1	1	1
Waste Handling Area ?		Soil	5	0 - 6 inches	None	Total RCRA Metals*			
Background Area		Soil	5	0 - 6 inches	None	Total RCRA Metals	1	1	1
Surface Water		Surface Water	5	Surface	pH, Conductivity, Temperature	Total RCRA Metals	1	1	1
Sediment		Sediment	4	0 - 6 inches	None	Total RCRA Metals	1	1	1
Totals MS/MSDs: 10 - 13		Samples: 92 - 142			EBs: 12 - 16		FDs: 12 - 16		

* Any soil sample exhibiting a RCRA total metal concentration greater than 20 times the regulatory limit for RCRA TCLP metal concentration will also be analyzed for

DRAFT
TCLP

DRAFT

TABLE 2

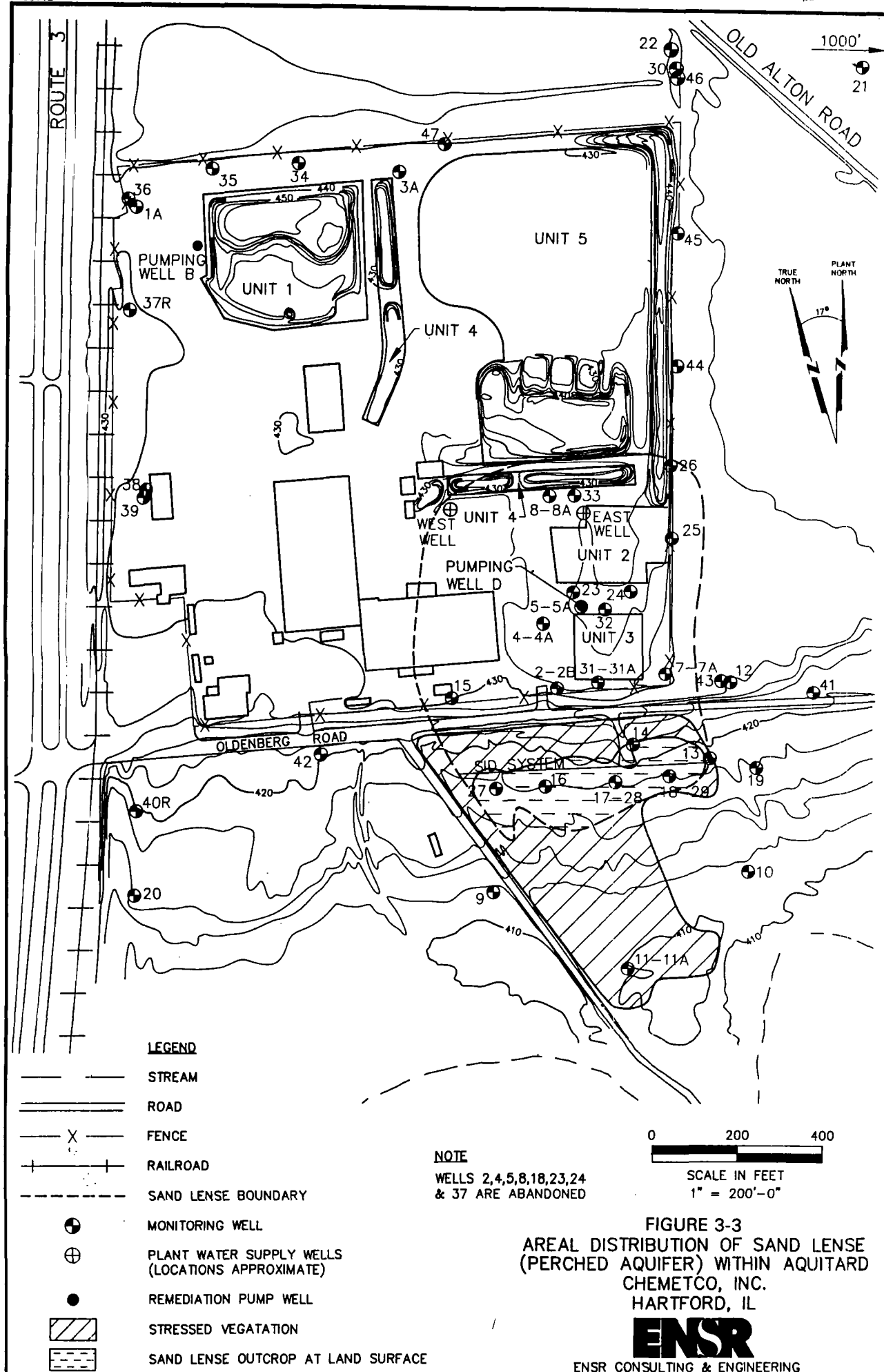
**ANALYTICAL METHODS, SAMPLE CONTAINERS,
PRESERVATIONS, AND HOLDING TIME REQUIREMENTS**

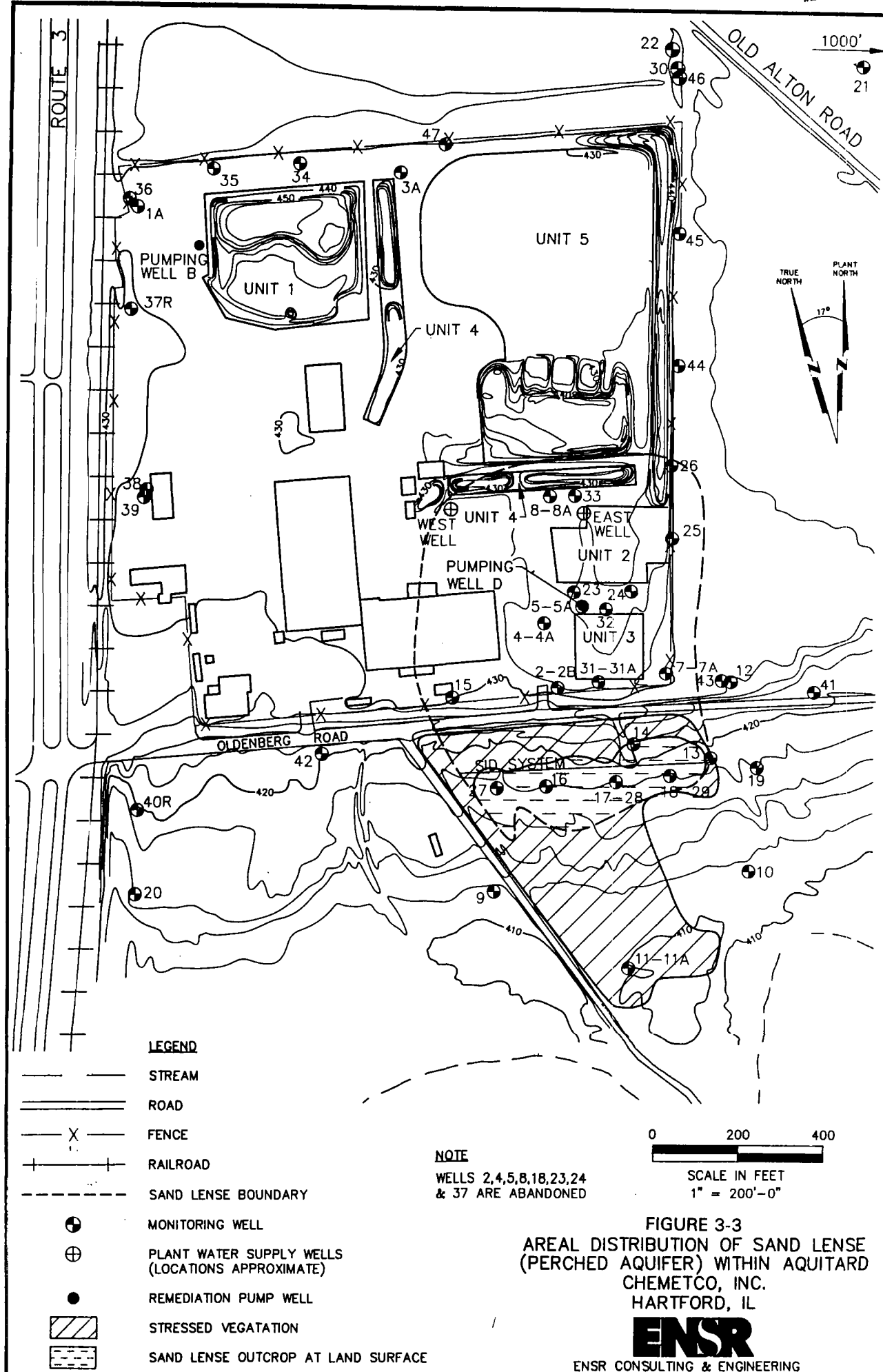
DRAFT

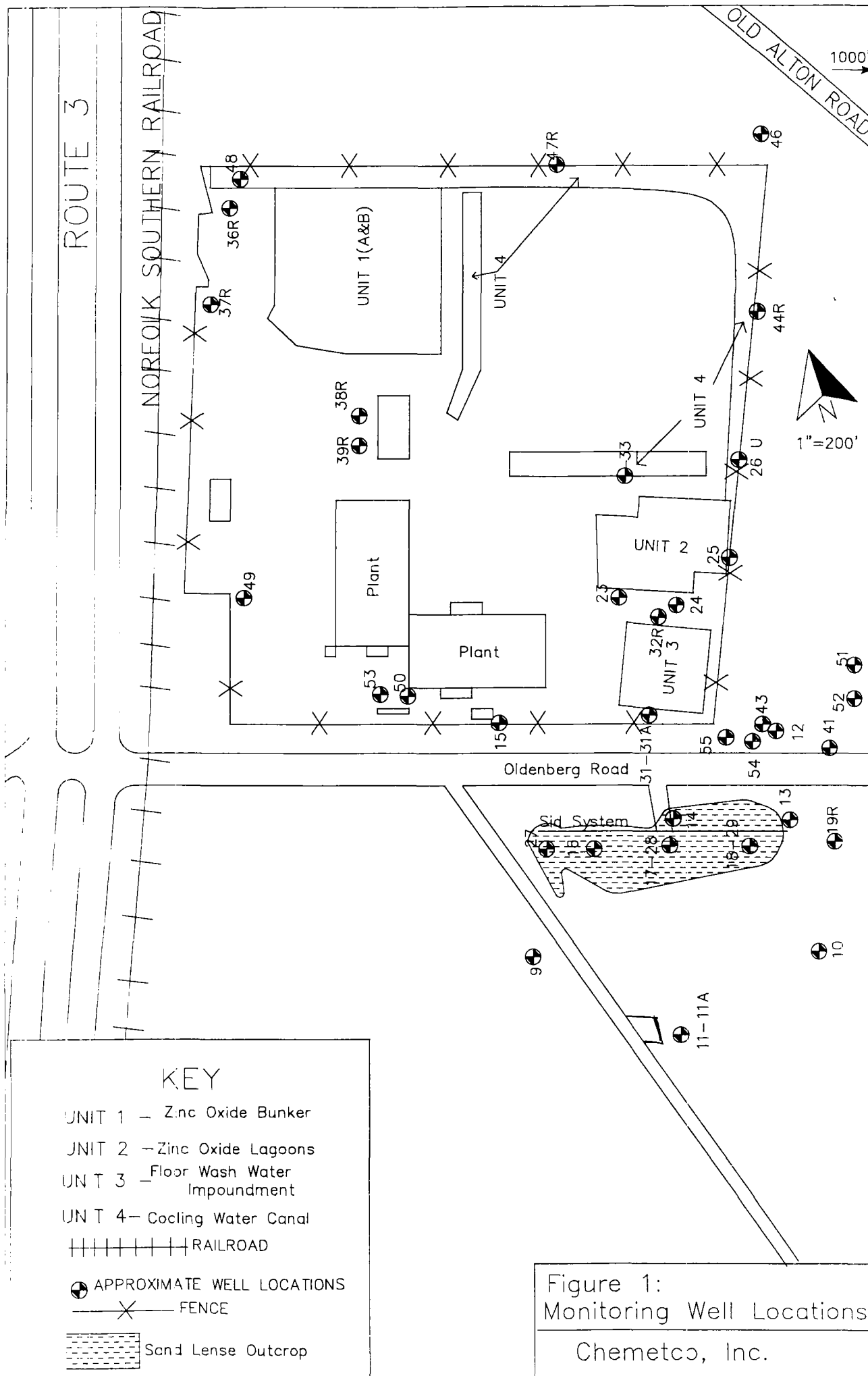
TABLE 2
ANALYTICAL METHODS, SAMPLE CONTAINERS,
PRESERVATIONS, AND HOLDING TIME REQUIREMENTS

Parameters	Analytical Method	Matrix	Holding Time	Container	Preservative
TCLP Metals	Sample Preparation: SW-846 Method 1311 Sample Analysis: SW-846 Method 6010B	Waste, Soil	6 months*	4-ounce glass jar	Cool to 4°C
Total RCRA Metals	Sample Preparation: SW-846 Method 3010/3005 (Water) 3050 (Soil/Sediment) Sample Analysis: SW-846 Method 6010B and 7000 Series as necessary based on results for arsenic, lead, and selenium	Surface Water, Wastewater	6 months*	1-liter poly bottle	HNO ₃ to pH < 2, Cool to 4°C
		Soil, Sediment	6 months*	8-ounce glass jar	Cool to 4°C

* Holding Time for total mercury is 28 days.







ARMSTRONG, TEASDALE, SCHLAFLY & DAVIS

*Attorneys and Counselors
One Metropolitan Square
St. Louis, Missouri 63102-2740
(314) 621-5070
Telecopier (314) 621-5065*

WARNING

THE INFORMATION CONTAINED IN THIS COMMUNICATION IS CONFIDENTIAL, MAY BE ATTORNEY-CLIENT PRIVILEGED, MAY CONSTITUTE INSIDE INFORMATION, AND IS INTENDED ONLY FOR THE USE OF ADDRESSEE. UNAUTHORIZED USE, DISCLOSURE OR COPYING IS STRICTLY PROHIBITED AND MAY BE UNLAWFUL. IF YOU HAVE RECEIVED THIS COMMUNICATION IN ERROR, PLEASE IMMEDIATELY NOTIFY US AT (314) 621-5070 EXT. _____ AND RETURN THE ORIGINAL MESSAGE TO US AT THE ADDRESS ABOVE VIA THE UNITED STATES POSTAL SERVICE. WE WILL REIMBURSE ANY COSTS YOU INCUR IN NOTIFYING AND RETURNING THE MESSAGE TO US. THANK YOU.

DATE: May 26, 1998

TIME:

PLEASE DELIVER TO:

NAME: Heather Young

FIRM: Chemetco

ADDRESS: Hartford, Illinois

BUSINESS TELEPHONE:

FACSIMILE TELEPHONE: (618) 254-0138

FROM: George M. von Stanwitz

TOTAL PAGES INCLUDING THIS PAGE: 5

IF YOU DO NOT RECEIVE ALL THE PAGES, PLEASE CALL (314) 621-5070

and ASK FOR EXTENSION 7977.

RE: _____

INTERNAL USE:

CLIENT-MATTER NUMBER: 11378-1

TELECOPIER OPERATOR: R. Heitman

Via fax

May 26, 1998

Mr. Patrick Kuefler
US Environmental Protection Agency
Region V
77 W. Jackson Blvd
Chicago, IL 60604

RE: USEPA Site-Specific Sampling and Analysis Plan Waste, Soil, Surface Water, and Sediment Sampling (no date)

Dear Mr. Kuefler
letter with

and document
This is a follow-up to our phone call on Tuesday, May 19, 1998, regarding the draft USEPA sampling plan and Chemetco's comments. Below are comments and concerns which we discussed on Tuesday. We look forward to your visit.

- comment*
1. Page 2 refers to information obtained from IEPA which identified four solid waste streams requiring characterization at Chemetco: waste slag, baghouse dust, zinc oxide, and, spent refractory brick. In fact, all four of these materials have been characterized. Air-cooled slag was characterized in 1988 and deemed non-hazardous already. Slag fines have been characterized and, although they exhibit characteristically hazardous levels of lead more often than not, they are reused as a substitute and in addition to sand in the Dust Injection System (DIS). The water-cooled slag which meets specifications is a product and, therefore, not a waste. Baghouse dust also, more often than not, exhibits characteristically hazardous levels of lead. The baghouse dust is reused in the DIS to help to absorb excess moisture. Chemetco has characterization data of zinc oxide from the bunker as well as current production. Although newly generated zinc oxide is characteristically hazardous for lead, it is a product and therefore, not a solid waste. In regards to the refractory brick, it is reclaimed, and, therefore, is not a spent material and not a solid waste.

2. On page 2, "Waste slag is generated from both water-cooled and air-cooled processes in the Slag Drying and Screening Building. Slag is screened and subsequently stored into five separate slag piles identified as Units (Figure 2)."

The slag generated is not a waste, it is a by-product from the copper smelting process. Granulated slag is currently generated by quickly cooling molten slag with a thin, steady water spray. Molten slag which cools while the Kress pot is transported from the foundry to the cooling barge, or skulls, are placed to the east of the cooling barge. The approximate ratio of water cooled slag to the skulls is 8:1.

Chemetco is unsure of what is being referred to as the "Slag Drying and Screening Building". The Slag Granulation Plant is located adjacent to where the molten slag is water-cooled. The

five separate slag piles identified as Units (Figure 2) are not clear. Units identified as 1 through 4 are units currently addressed by the approved Interim Status Closure and Post Closure Plan dated June 1994. These include the old cooling canals (current stormwater canals), zinc oxide pits, old floor wash impoundment and zinc oxide bunker. Unit 5 on Figure 2 is where slag currently resides. Slag is no longer screened on the hill.

3. *A total of four baghouses are utilized at the facility to control air emissions, including one baghouse associated directly with the Slag Drying and Screening Operation, one baghouse associated with the Slag Grinding Operations, and a roof baghouse on the Slag Drying and Screening Operation Building. Information obtained from the IEPA indicates significant volumes of baghouse dust accumulates on concrete and/or asphalt surfaces outside the Slag Drying and Screening Operation Building. In addition, the IEPA has indicated that baghouse dust has been stored on-site at the Chemetco facility in the slag pile Units (Figure 2).*

Chemetco is unclear as to what four baghouses USEPA/IEPA is referring to since the Slag Granulation Plant has only primary and secondary baghouses (2 baghouses). Chemetco has five (5) baghouses on-site which are referred to as the #2 baghouse (roof of foundry), #1 baghouse (in the American Air Filter (AAF) area), the primary baghouse for slag granulation, the secondary baghouse for slag granulation, and the DIS.

Pursuant to IEPA's indication that significant volumes of baghouse dust accumulates outside the Slag Drying and Screening Operation Building, Attachment 1 includes inspection procedures which were developed in December 1997 and an example of the inspection sheets which are completed daily. Also, collection hoppers are fitted with permanent lids and elasticized covers, are used for transport of the dust collection hoppers to the Fines Building.

4. *Page 2, "This zinc oxide pile was later converted to a Zinc Oxide Bunker, and is still used for zinc oxide storage in current facility operations."*

The zinc oxide bunker is not utilized in current facility operations. It is not used for storage of current generation zinc oxide. No zinc oxide has been added to the bunker since it was originally constructed and filled.

5. *Pages 2 and 3, "To process spent refractory brick, the facility currently operates an IEPA-air permitted rock crusher. This crusher generates residual brick "fines" and wastewater from air emission control."*

The IEPA-air permitted rock crusher has not been utilized to crush spent refractory brick, therefore, there are no brick "fines" or wastewater from air emission control. Although the crusher has received an air permit, it is not currently utilized.

6. *"To characterize the waste slag generated at the facility, samples will be collected from the slag pile Units, the slag accumulation areas associated with the Slag Screening Operation, and the slag "fines" discharged from the Slag Drying and Screening Operation."*

The old generation slag, or air-cooled slag, pursuant to testing conducted in 1988 is already non-hazardous. Sampling protocol and statistical methodology was agreed to by IEPA, USEPA, and Chemetco and a letter was issued to Chemetco agreeing that the air-cooled slag is non-hazardous. Although TCLP is the present testing methodology used to determine whether a material is characteristically hazardous, EPTOX was the testing methodology used and recognized by the regulatory community in the late 1980's. Chemetco questions the need and motivation to revisit a decision that was made and agreed to 10 years ago by all parties.

(state what piece of equipment will be available)

*Catpilla
215
w/bucker*

7. USEPA mentions the use of heavy equipment to assist with vertical characterization. ~~Will USEPA be bringing heavy equipment with them or renting equipment locally? Chemetco does not know what equipment is needed if they are expected by USEPA to supply it.~~

8. Page 3, "It is anticipated that a minimum of five samples will be collected from each slag pile Unit and a minimum of three samples will be taken in each slag processing area."

Again, please clarify slag pile Units and the slag processing areas.

9. Page 3, "To characterize the dust generated from the four baghouses, a minimum of three samples will be taken from each baghouse."

Again, what four baghouses is USEPA referring to? Chemetco has five (5) baghouse, two of which are at the Slag Granulation Plant.

10. Page 3, "To characterize the zinc oxide filter press sludge, a minimum of three samples will be taken from the zinc oxide filter press and a minimum of five samples will be taken from the Zinc Oxide Bunker. In addition, a minimum of five samples will be taken from the zinc oxide product storage area where zinc oxide is accumulated for off-site transport."

if disposal of
Chemetco already has data to characterize the current generation zinc oxide. No zinc oxide or other materials have been placed in the bunker since the cooling water canal was closed in September 1985. It is not clear why USEPA is characterizing materials which have already been characterized. Chemetco has never claimed that the zinc oxide is not characteristically hazardous. ~~Although it is characteristically hazardous, it is a product, not a waste.~~ ★

11. Page 4, again, there are no residual "fines" from the brick crusher (rock crusher), nor is there associated wastewater.

12. Page 4, "Soil samples will be collected to determine if there have been releases of hazardous constituents to soil in the refractory brick waste pile area and waste handling areas."

The refractory brick is stored on concrete. *Also* Please clarify "waste handling areas".

13. What general area does USEPA intend to sample for background?

14. Page 4, "Surface water and co-located sediment samples will be collected to determine if there has been releases of hazardous constituents to Long Lake, which is located south of the operations area of the facility (Figures 1 and 2). Surface water and co-located sediment samples will also be taken in the drainage ditch north of Containment Area 4, also located south of the operations area (Figure 2)."

Remediation of this area is currently under negotiation with IEPA. Chemetco took samples during the initial containment of the spill. Samples are contained in the Zinc Oxide Spill Remediation Plan Revised 3-98. This sampling appears to be redundant. In addition, Chemetco has recently performed surface water sampling of all four containment areas. This information is also available. ★

15. Page 7, "The report will include a discussion and statistical analysis of the results of the sampling effort."

Exactly what statistical methodology is intended for use and involving what data? Again, the air-cooled slag has already been sampled and statistically shown to be non-hazardous. This was agreed upon by all parties in 1988. If USEPA intends on only taking a total of 50 samples of the

*Sample 1, 6, 8
I did*

air-cooled slag for use in a statistical analysis to determine whether the air-cooled slag is characteristically hazardous using TCLP. Chemetco strongly objects for several reasons. The slag is not a homogeneous material but rather heterogeneous as exemplified in the 1988 sampling event. The amount of slag on-site along with the heterogeneity of the material would require a much greater number of samples to be taken than only the fifty samples proposed. If USEPA's intent behind the resampling of the slag is to characterize the air-cooled slag, previously characterized as non-hazardous, as hazardous, Chemetco will be forced to seek statistical expertise to refute any alleged characterizations which are a result of this sampling event.

note reason in clear
a much more detailed inspection with statistical analysis will be necessary

In general, the sampling of air-cooled slag is wholly unnecessary and a waste of money. Sampling protocol, results and statistical analysis were all agreed to by USEPA, EPA, and Chemetco back in 1988. The air-cooled slag was deemed non-hazardous. What justification is there for resampling the slag 10 years later?

Also, waste determinations are the responsibility of the generator. USEPA/EPA is constantly referring to the zinc oxide, slag, baghouse dust and refractory brick as waste. The materials are either reused, recycled, or reclaimed in accordance with applicable regulations and are therefore not solid waste. Chemetco is not disputing that the zinc oxide, slag fines, baghouse dust and refractory brick can be characteristically hazardous, but the regulations allow reuse, reclamation and recycling.

Again, Chemetco looks forward to your visit and if you have any questions or require additional information please call me at (618) 254-4381 ext. 268.

Sincerely,

Heather Young
 Contractual Environmental Manager

cc: ~~John Sauer~~
 Bruce Hendrickson
 Greg Goner
 Chris Davis

GMS

Tom Marten (via fax)

